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CONTENTS

Original Papers	Page
Angioid streaks of the fundus oculi. J. Phinizy Calhoun	91
Angioid streaks of the retina. J. Milton Griscom	95
Some features of glaucoma complicating iridocyclitis. Fred T. Tooke	97
Posterior sclerotomy for glaucoma. Harry Friedenwald	107
Retroconjunctival posterior sclerotomy in glaucoma complicated by corneal or conjunctival infection. Jonas S. Friedenwald	111
Relation of ophthalmology to prevention of blindness. Edward Jackson	112
Sight-saving class work from the standpoint of the ophthalmologist. E. V. L. Brown	118
Cycloplegics in refraction. David W. Wells	120
Pathology of the lacrimal glands in chronic epiphora. M. N. Beigelman	125
Congenital bilateral microphthalmos accompanied by other malformations of the body. Arthur M. Yudkin	128
Society Proceedings London, Colorado, Philadelphia, Baltimore, Nashville, Puget Sound, Pittsburgh.	132
Editorials	147
Book Notices	151
Abstract Department	159
News Items	183

For complete table of contents see advertising page V

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ANGIOID STREAKS IN THE RETINA. (F. P. CALHOUN)

AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 11 February, 1928 Number 2

ANGIOID STREAKS OF THE FUNDUS OCULI

F. PHINIZY CALHOUN, M.D., F.A.C.S.

ATLANTA, GEORGIA

The possible causes and mechanism of such streaks are discussed. A case is reported in which connection of the form with the choroidal vessels is supported; and possible origin in familial vascular disease is suggested. Read before the American Ophthalmological Society, June 27, 28, 29, 1927.

Much has been written concerning the origin and site of angioid streaks of the ocular fundus, a condition first described by Doyne in 1889. The subject is still a matter of controversy and speculation. A comparison of many cases offers certain common clinical characteristics which may be briefly reviewed.

These streaks appear about middle life, with an equal distribution in the two sexes. Both eyes are usually involved. Vision varies, often normal with normal fields even with well developed streaks. The streaks are situated at a deeper level than the retinal vessels, with which they do not communicate. In advanced cases the lines have a circular arrangement a short distance from the disc margin, and from this circle other lines radiate, anastomosing with one another. These lines, sharp or ill-defined, broad or narrow, run towards the equator, but rarely beyond it.

The color of the streaks is usually brown, but it varies when observed over a long period. Thus at first they may have a brick red appearance which later changes to brown, and in some cases they assume a grey or lead color. Late in the picture white lines often follow the course of some of the streaks. Additional fundus changes are frequently noted, such as pigment dots in the deeper layers of the retina, a mottling of the choroid, areas of choroidal atrophy, large white plaques or exudates, and deep hemorrhages in the retina, over which pass the retinal vessels. Coppez and Danis followed a case twenty-five years. Seventeen years after the formation of the lines, changes developed in the macular region which consisted chiefly of an edema, with hemorrhages and exudates.

As to the origin of these streaks, it is generally considered that some type of hemorrhage in the outer layers of the retina or choroid precedes their formation. Physical and laboratory examinations of many of these patients have failed to suggest a cause. The question whether these streaks lie within the layers of the retina or choroid has given rise to much speculation. The recent literature has been carefully reviewed in two excellent articles, by Treacher Collins and Ejler Holm, and a repetition seems unnecessary, except to mention the more important thoughts.

Lister's much reported case, in which he found microscopically newly formed vessels enveloped in pigment in the outer layers of the retina, can hardly be accepted, for the case was not examined ophthalmoscopically. Bayer considered the streaks to be located in the outer plexiform layer, while Guist placed them in the layer of pigment epithelium and likened them to folds seen in detachment of the choroid. Kofler and Lohmann considered them as fissures in the lamina basalis. The latter thinks they are caused by a diminution in the elasticity of that layer, and compares the streaks to cracks seen in lacquer. He further suggests that the ring-like arrangement of the streaks around the disc is to be explained on anatomical grounds related to the implantation of the optic nerve.

Wildi, who examined four cases with the Gullstrand ophthalmoscope, places the streaks in the outermost strata of the retina; or in the pigment epithelium, or Bruch's membrane. He considers that the whole clinical course indicates a degenerative process, from the observation that "drusen" were found in all of his cases.

The resemblance of the streaks to the arrangement of the choroidal vessels has long been noted, but it was thought that the layer of pigment epithelium would obscure them. The error of this view is manifest, for one often sees, even in the negro, choroidal vessels in contrast to the pigmented intervascular spaces. Holm cites a unique case in which pigment dots followed the course of several choroidal vessels, presenting a striking similarity to angioid streaks, in that the picture was bilateral with diffuse alterations in the choroid and retina.

The general arrangement and uniformity of the streaks suggested to Collins that there must be some anatomical factor upon which this distribution depended. From this he evolved his hypothesis, which is stated in the following manner.

The short posterior ciliary arteries, about twenty in number, penetrate the sclera around the optic nerve, and anastomose internally a short distance around the nerve margin, forming a circle known as the circle of Zinn or circulus arteriosus nervi optici. From this circle, branches extend forward to supply the posterior half of the choroid. Should there be from any cause a subchoroidal hemorrhage, "blood extravasated into the lymph spaces between the sclera and choroid is only slowly absorbed, as is stagnant blood in other parts of the body; and the hemoglobin dissolved out of its red corpuscles would tend to break up into insoluble crystals which, if deposited along the tract (perivascular lymph space) of the short ciliary arteries, would give rise to such appearances as we see in these angioid streaks."

Collins explains further than extravasation of blood into the subchoroid produces an ischemia of the choroidal vessels, which if prolonged will cause the rods and cones to perish and the cells of the pigment epithelium to migrate into the retina through the gaps in the limiting membrane left by the disappearance of the rods and cones. Prolonged ischemia of the choroidal vessels leads to atrophy of that layer; and the dense white plaques often seen in connection with the streaks, as well as the white lines along their margin, are explained by the formation of fibrous tissue derived from the blood clot.

The case which I wish to report is a most extensive one and Collins' theory seems to explain many of the complications which had never before been well understood.

Case: W. C. H., age 35 years, physician. Noted dimness of vision about July, 1925, commencing first in the right eye and some months later in the left. There was no previous history of eye trouble, in fact, as a busy urologist, he had for many years constantly used his eyes without effort in cystoscopic and microscopic work. The family history is of some interest. His father died from an injury at the age of 54 years. His mother is living and well at 86 years. One brother was drowned, and another brother died suddenly at 26 years from a suspected heart attack. One sister died of glioma in childhood, another of toxic goiter at 42 years, another of eclampsia at 36 years, and still a third of intestinal hemorrhage at 54 years. Four sisters are living and enjoy good health. One living sister has "bilateral disseminated choroiditis involving the macular region. The fields are fairly normal and there has been no active disturbance for several years." (Dr. Victor Ray, Jr.)

The patient's past history is unimportant. He uses tobacco excessively, does not drink, works long hours and at high tension. In July, 1925, he noted that the street curbing appeared crooked. He was told that this might be explained by an astigmatic error, although the vision was not improved above 20/50. No cause was then assigned for this visual reduction.

In February, 1926, the vision in the right eye suddenly dropped to 15/200 and the left eye began to be involved. Then retinal hemorrhages and exudates were recognized. The patient was carefully and repeatedly examined in an endeavor to locate the cause. Special attention was directed to syphilis and tuberculosis, and to the possible sources of focal infection. The examinations and tests were constantly negative, except that one tooth was found infected, which was removed.

It was in March, 1926, that I first made an examination. The ocular condition was as follows: V. R. 15/100, L. 20/50. The refraction was a low compound hyperopic astigmatism. The fields for form were full; but there was a large central scotoma in the right eye and a paracentral scotoma in the left eye. The external structures were normal, the corneal and pupillary reflexes active, and the motility and ocular tension normal.

Ophthalmoscopic examination of the right eye showed clear media. The disc was round with a yellowish tinge. The cup was shallow, and from it emerged normal vessels, passing evenly across the disc margins, which were slightly pigmented and hazy. The retinal vessels were normal in size and caliber throughout their course. A short distance from the disc margin was an incomplete irregular brownish ring, from which extended various anastomosing branches. These lines varied in size and color. Toward the equator of the globe, where some of them terminated, they abruptly lost their net-like arrangement and gradually took on the course of retinal vessels. Some of these streaks appeared to be at a deeper level than others, and where two lines crossed the color was darker.

To the nasal side of the disc a broad, fairly straight, pigmented streak, being an extension of a curved one, ran obliquely upward and inward, and terminated in a small punched out area of choroidal atrophy. A dense white line followed its course on the outer side. Two disc diameters above the disc was a small atrophic area in the choroid, and in the macular region a similar but larger area with its borders heaped with pigment. Over these pathological lines and areas coursed the retinal vessels in a normal manner, without visible communication.

The left fundus was similar, but its changes more extensive, in spite of better vision. The brownish lines around the disc were more broad and irregular in size and had a more net-like arrangement. Whitish streaks bordered many of the brownish lines, when they were straight and ran any distance. Above and below the disc were areas of dense scarring in the choroid, besides several smaller ones situated within, above, and below the macular region. Many of these brownish lines seemed to communicate with the patches of choroidal atrophy. On each side of and below the macular pathology were long extravasations of blood which appeared to be in the outer retinal layers, for the retinal vessels passed over them. Like the right eye the retinal circulation was normal throughout, and the vessels passed over the choroidal areas and brown lines without communication.

Inasmuch as angioid streaks usually involve both eyes, and as in some instances it has been noted that other members of the family have the same condition, an endeavor has been made to link the eye picture with some constitutional disturbance. Investigations, however, have been futile. The family history of this patient seems to confirm such a suspicion. The death of a brother at an early age from a heart attack, the death of a sister from intestinal hemorrhages, and a living sister having bilateral choroiditis (which might have been an atrophy from hemorrhage and not from infection), as well as the condition of the patient under discussion, strongly suggests some disease of the vascular system which might be familial in origin.

As to the anatomical origin of these streaks, it would seem that they are dependent upon a choroidal or subchoroidal hemorrhage, of unknown origin, which involves the posterior portion of the globe. Collins' hypothesis best

explains the color and distribution of the lines and the complications in the choroid and retina which are often seen in extensive cases.

In viewing the choroidal circulation with the ophthalmoscope, one gains the impression that the larger vessels, especially those in the region of the disc, have a net-like anastomosis. This is only in part true, for Leber has shown from injected specimens that this is brought about by repeated crossing of the vessels. This anatomical arrangement is somewhat represented by the general morphology of the angioid streaks, for in the case here reported some of the streaks appear to lie at different levels and some are denser than others, and besides one may imagine the color to be darker where two streaks cross. Whether or not this hematogenous pigment is in the perivascular spaces must yet be proven. Pigment granules adherent to the vessel walls without relation to lymph spaces might present the identical picture, as illustrated in Holm's case.

I have seen brownish lines, having all the appearance of early angioid streaks, form in a case of neuroretinal edema accompanied by a typical macular star. The brownish lines did not disappear until after the disappearance of the edema and exudates, and then they radiated characteristically from the disc. After some weeks they were absorbed. My first impression was that, in the presence of edema, a fold or wrinkle had formed in the membrana basalis, and that a deposit of pigment (derived from the pigment epithelium) had formed along the fold. But the fairly rapid absorption of the brownish line suggested a free lymphatic circulation. Collins contends that the pigment deposit is in the periarterial and not in the perivenous lymphatic spaces, for in the former the spaces are smaller and the flow is less free. It is very possible that a vein was involved in this instance.

This report is made (1) to illustrate an extensive case of angioid streaks of the fundus oculi, in which the family history pointed strongly to some familial disturbance of the vascular system; (2) to subscribe to the hypothesis formulated by Collins, which seems to explain not only the origin and formation of the streaks, but the complications which frequently accompany them.

436 Peachtree street.

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ANGIOID STREAKS OF THE RETINA

J. MILTON GRISCOM, M.D.

PHILADELPHIA

In the case here reported there was also pigmentation of the skin of the forehead. The explanations suggested for cases previously reported are mentioned and the additional suggestions made of possible neurotrophic disturbance. Presented before the Section on Ophthalmology of the College of Physicians of Philadelphia, March 17, 1927.

The following notes concern the details of a case of angioid streaks of the retina. J. M., colored, age 68 years, came to the Wills Hospital on March 1, 1926, complaining of diplopia which had existed for six months. The external examination of each eye was negative, except a paresis of the left superior rectus, which caused a hypophoria of 9°.

Ophthalmoscopic examination of the right eye revealed dense peripheral lenticular opacities and a few semi-transparent vitreous opacities. The nerve head was of normal color, with a small central physiologic cup, visible lamina cribrosa and margins well defined. The vessels were somewhat small, and the arteries showed a moderate degree of degeneration. The macula was normal in appearance, and the periphery was negative except for a very slight retinal pigment disturbance. At no place were there any visible retinal hemorrhages, or any evidence of previous retinal or choroidal disease. Surrounding the disc, about 0.5 d.d. from it, was an irregular reddish brown zone of pigment, more pronounced above, lying definitely beneath the retinal vessels. From this band radiated several streamers of similar color and location, with irregular and somewhat serrated borders. These streaks were slightly tortuous, and became narrower as they radiated from the zone surrounding the disc into the periphery for distances varying from three to six d.d.

The left eye showed the same ophthalmoscopic picture of the media and fundus, except that the pigmented band surrounding the disc was broader, better defined and more deeply pigmented than in the right eye, and that the radiating streaks were more numerous and better defined and extended further into the periphery. In both eyes, the streamer-like bands narrowed rather sharply and faded out before the extreme visible periphery of the fundus was reached. Vision was 20/40 in each eye, corrected to 20/20 with low plus spheres. Visual fields were somewhat contracted for form and color, part of which may be accounted for by a sluggish mental reaction.

The patient exhibited a peculiar, irregular slate-colored pigmentation on the skin of the forehead, and was sent to the dermatological clinic of the Jefferson Medical College. Dr. E. F. Corson reported the case to be one of probable chloasma and stated that this condition, although not definitely classified, was supposed to be a pigment proliferation due to neurotrophic influences. Because of the partial third nerve paralysis, the patient was put on antisyphilitic treatment, although his Wassermann was negative. During the past year the superior rectus palsy has improved, but no change has been noted in the pigmented streaks or in the discoloration of the skin of the forehead.

Since the first case of angioid streaks was reported by Doyne, in 1889, many contributions have been made to the literature of this subject, consisting with one exception of clinical reports and observations on the fundus details. In 1911 Magitot[1] published the microscopic findings of a case which he had observed one year before death. He stated that no new vessels were present, and believed that the streaks were due to regressive changes in old hemorrhage. Bayer[2], who examined Magitot's slides, disagreed with the statement that no new vessels were present, and Collins[3] did not believe the case a

typical one of angioid streaks. In view of the uncertainty surrounding this pathological report, the interpretation of the way in which the streaks are formed is still speculative.

In the great majority of reported cases, retinal hemorrhages or signs of choroidal disease were found, from which evidence certain observers concluded that the pigment lines came from ruptured retinal vessels. Indeed, in four reported cases the streaks were seen to develop from hemorrhagic areas in the retina. Another group advanced the theory that cracks or wrinkles in the lamina vitrea, followed by pigment proliferation, explained the fundus picture, while others believed the streaks to be newly formed vessels in the deeper layers of the retina, or in the inner layers of the choroid, probably secondary to some inflammatory process. A recent explanation is given by Collins[4], who believes that angioid streaks are formed by hematoidin and hemosiderin, derived from old subchoroidal hemorrhages and deposited around the short ciliary arteries and the circle of Zinn.

In the case reported, it is difficult to explain the formation of streaks as due to either retinal or subchoroidal hemorrhages, since there is no visible evidence of past or present change in these structures. The bilateral and symmetrical character of the lesions seems to indicate a cause more remote than local degeneration or inflammation. The pigmentation of the skin of the forehead, as far as the writer can determine, has not been noted in the other reported cases. This may be due to a type of neurotrophic disturbance affecting certain branches of the fifth nerve, including the ciliary nerves. These enter the globe in the vicinity of the short ciliary arteries, surrounding the optic nerve head, and could account for the peculiar formation of the streaks, in a way similar to that described by Collins in his theory of hematogenous pigmentation.

The case suggests the thought that these two types of unusual pigmentation, one in the skin and one apparently located in the deeper layers of the retina, may have a common cause, giving rise to proliferation of the epithelial pigment cells in each locality.

2213 Walnut street

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SOME FEATURES OF GLAUCOMA COMPLICATING IRIDOCYCLITIS

FRED T. TOOKE, M.D.

MONTREAL

It is suggested that all cases of glaucoma are secondary. The author records a number of cases of glaucoma typically due to iridocyclitis, yet remote y different as to etiology, clinical manifestations, pathological findings, and treatment required. Read before the New England Ophthalmological Society, November 15, 1927.

Glaucoma is a problem, and, in my humble opinion, one that must be answered in a variety of ways. Although we have been taught to subdivide glaucoma into primary and secondary, yet in the light of more recent investigation, notably that of Martin Fisher and those two younger authorities who have more recently come among us, W. S. Duke Elder and J. Herbert Waite, I now conclude that what we understand as glaucoma is a symptom, not a cause of disease, is a result, not the establishment of a perverted physiological function leading to a defect in the excretion of the aqueous, rise of intraocular tension, and ultimate loss of vision. Studies in biochemistry and in metabolism clearly show that such biochemical changes and such metabolic alterations are the factors which are primary, and that the symptoms which constitute glaucoma are secondary to these. The same argument may be applied in the case of anatomy.

To proceed with those disorders under our consideration tonight, they are unquestionably secondary, but not one whit the more so than those which I have already mentioned as falsely regarded as primary and for that reason problematic. That the subclass of cases of glaucoma responsible to an iridocyclitic etiology are easily recognizable as secondary, I challenge. I would provisionally suggest that all cases of glaucoma are secondary, as I have already dared to infer. With the advantage of a complete systemic examination, and the rational establishment or estimation of the source of an auto-

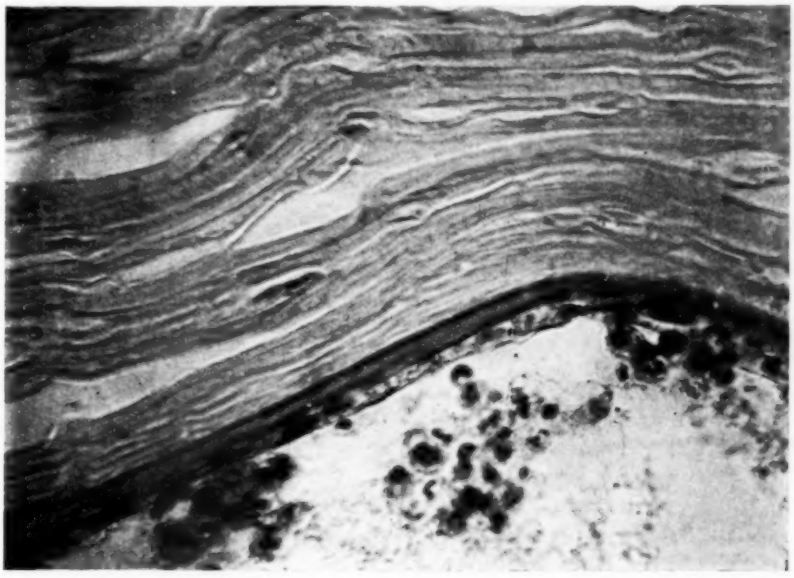

FIG. 1. Collection of various types of white blood corpuscles, large mononuclears, small mononuclears, and polymorphonuclears, with albumin and exudate constituting what is recognized clinically as keratitis punctata or cyclitic dots.

genetic or focal infection, the elimination of the primary source inhibits the establishment or production of the secondary result in the form of symptoms clinically recognized by the name of glaucoma.

Again, the advent of the slitlamp, with special features to facilitate detailed examination about the filtration angle, has unquestionably, in cases

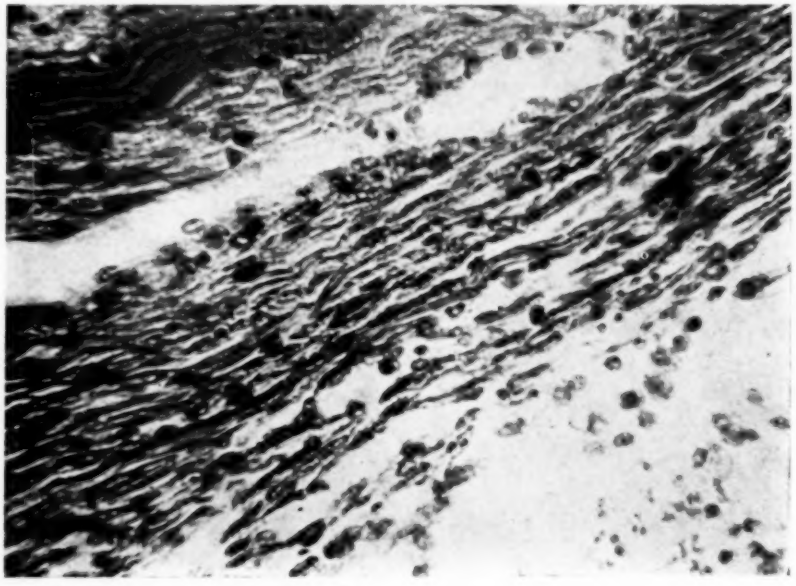

Fig. 2. The same elements at the filtration angle in an attempted percolation through the pectinate ligament. The outermost spaces of Fontana are apparently patent, but these are manifestly more occluded as they approach the canal of Schlemm.

regarded as insidious or benign, even if at all recognizable clinically, shown us the truth in the manifestation of diseased or pathological processes in the course of development in and about the anterior chamber. It is true that many of such cases are self-evident, but on the other hand, as I have already suggested, many are not so. Yet whether easily apparent, or whether beset with unusual difficulty in recognition, each case in my opinion is a law unto itself, each constituting its own special enigma, and each presenting its own peculiar problem relative to a solution, not only as to diagnosis, but also regarding treatment as well as prognosis.

In an attempt to prove this statement I am not going to weary you with a long series of cases extending over the lapse of years from the hospital to which I am attached. Nor am I going to borrow figures from other institutions in an endeavor to establish my point. I am, however, rather going to produce for your consideration a few typical cases of glaucoma due to iridocyclitis, remotely different as to etiology, clinical manifestations, pathological findings, and treatment, such as they have happened to present themselves in the course of a private practice during the past year, in the hope that my experience may strike, at least, some responsive chord among a number of those whose time is not necessarily spent in clinical wards or in pathological laboratories.

Case 1: Miss M. H. M., aged 26 years, a university graduate, was referred to me by Dr. Allan Cunningham of Halifax, N. S. She had always been short-sighted, and had worn a myopic correction. When Dr. Cunningham first saw her, a few days prior to her arrival in Montreal, he noticed, in the course of a routine examination of the eyes, that the left eye was hard, registering a tension of 45 mm. Hg. with

the Schiötz tonometer. The pupil was slightly dilated, there were no vitreous opacities, the optic disc was normal, and the field was not contracted. Under eserine tension was brought down to 34 to 36 mm. Hg.

When seen by me on her arrival from Halifax, the eye was insidiously quiet in appearance, and the pupil regular, proved the teeth to be in a healthy state. A Wassermann was negative, and three diagnostic doses of old tuberculin up to five mg. produced no reaction, rather to my surprise, as a patch of old chorioretinitis was visible and to me, at least, rather suggestive, running along the course of the inferior temporal vein.

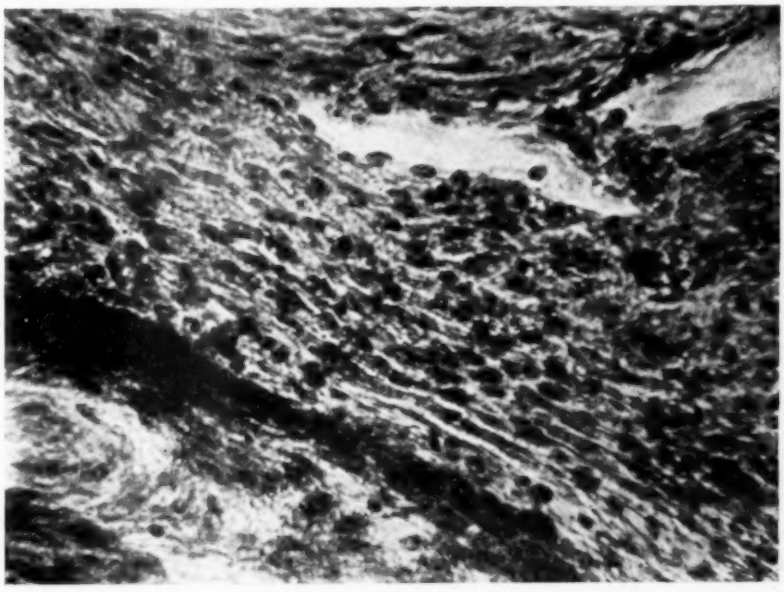

Fig. 3. A case of acute glaucoma, where, in contrast, the root of an edematous iris is firmly opposed to the pectinate ligament and where, in consequence, all the spaces of Fontana are occluded.

and contracted under eserine. There were no manifest cyclitic dots on the back of the cornea, the anterior chamber was of normal depth, and tension registered 30 to 35 mm. Hg. The slit lamp showed a generalized posterior bedewing of the cornea, but no actual clump formation nor a gross keratitis punctata. There were a few cells circulating in the aqueous, but no deposits on the anterior surface of the lens in so far as one could judge with a contracted pupil. Aspirin was prescribed, and atropine used instead of eserine four times daily. In one week the tension rose to 40 to 45 mm. Hg. A very complete systemic examination was undertaken without affording us the slightest positive finding except that of a chronic stagnation of function of the lower bowel. Tonsils and sinuses were negative, and skiagraphic plates

With the dilated pupil and the increased tension, dots were now very easily made out on the back of the cornea, and in some number, although there did not appear to be any increase in the number of cells in the aqueous.

The patient's diet was regulated, the question of constipation was attended to, atropine with gentle massage was persisted with in spite of tension. Two weeks later the keratitis punctata was noticed to be gradually disappearing, the eye throughout this period having remained absolutely white, cells were definitely fewer in the aqueous, and tension reduced to 17 mm. Hg., taken with three weights. Vision with the correction of a compound myopic astigmatism of high degree was 6/7 at the time of her discharge. Miss M. has remained well for the past six months.

Case 2: H. H., aged 24 years, a student in the faculty of Applied Science in McGill University, came to me complaining definitely of halos about lights before the left eye, with periodic blurring of vision. His description of his symptoms was quite definite and characteristic. The eye was absolutely white, the pupil reacted to light and accommodation, the anterior chamber was of normal depth, and there was no pathological alteration in the fundus. As no attack was in progress at the time of his examination, vision was normal. Fields of vision were full. With the slitlamp one could detect absolutely no change in the iris, or any deposits from it on the anterior lens capsule. I was unable to make out any cells circulating in the aqueous. There was one solitary cyclitic dot, not more, on the back of the cornea, and tension was 35 mm. Hg. with the Schiötz tonometer. Eserine was used for two days to reduce tension, and then atropine was pushed energetically when normal intraocular tension was established.

Eight or ten months later he returned with precisely the same symptoms and precisely the same benign looking eye, to all external appearances free from every evidence of inflammation, the pupil dilating regularly, with normal central as well as peripheral vision. There were now two or three dots on the back of the cornea; but I could not detect any cells in the aqueous, although doubtless they were present. The fundus was normal and tension registered 40 to 45 mm. Hg. Aspirin was prescribed as a routine, eserine used for two days, and then atropine. His dentist detected two dangerous teeth which had been overlooked on a former examination, and these were extracted. Tension was reduced to 15 mm. Hg., and has remained down with no ocular symptoms of discomfort for the past seven months.

Fig. 4. A case of chronic iritis with a definite tubercle on its anterior surface. Note the dense posterior synechiæ, the pigment and lymph covering the anterior lens capsule, and the cataractous changes in the anterior cortical cells. Compare Case 3.

Case 3: Mrs. E. H. W., married, aged 34 years, the mother of two healthy boys, had been suffering from a sore left eye for over three years, and had been under the care of a specialist in another province. An iridocyclitis of undetermined origin had doubtless been recognized, and with it a periodic if not persistent rise in tension, which unfortunately for the patient had not

been taken into consideration. This periodic elevation in tension caused the patient considerable pain and annoyance. She had been using atropine for some time. On examining the eye one could note more than one definite bleb or bulla of the corneal epithelium. Tension was distinctly raised to the fingers, and with the tonometer registered 45 mm. Hg.

Case 4: M. C., aged 62 years, an artist of international reputation, consulted me for an eye that had been inflamed for about a week. He attributed the trouble to a cold which he had contracted and had not paid any particular attention to it. The right eye was free from symptoms. The left eye showed a moderate degree of superficial injection only, with a small

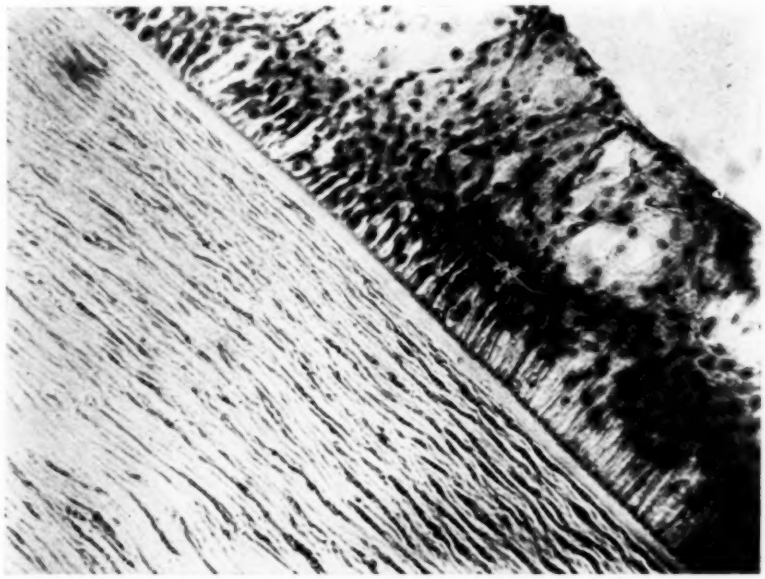

Fig. 5. A later development as in case 3. A definite edema of the basement cells of the stratified layers lying directly over Bowman's membrane. Above these are regular vacuoles or spaces between the layers of stratified epithelium. At certain points these last have actually broken down and the outermost layers of cells have been thrown off, thereby constituting a keratitis bullosa.

The slitlamp showed a definite old iritis, with tubercles at the pupillary margin above. There were also complicated cataractous changes in the lens. The blebs and infiltration of the cornea precluded a great deal of detail with the lamp, but one could definitely make out a practically complete posterior or ring synechia, with an attendant shallow chamber.

I performed an iridectomy, and recovery was uneventful. Owing to the lenticular changes, little was to be anticipated regarding vision. When seen in September last, tension was well within normal limits, and the patient said that she had been absolutely comfortable since her discharge from the hospital nine months previous.

crescentic ulcer of the cornea just within the limbus at the temporal side. It measured about 3 by 1 mm., and stained readily with fluorescein. The nasal duct was clear, and a smear of a scanty conjunctival secretion exhibited only a very few pneumococci, and one or two very problematic diplobacilli. Considering the type of ulceration found in a diplobacillary infection, by anticipation, I presume, rather than by actual demonstration of the microorganisms, I ordered zinc and scopolamine, applying tincture of iodine to the ulcer, and bandaging the eye between the periods when drops were to be used. There was but slight improvement after a week. Although the ulcer was somewhat smaller, it still stained;

the pupil was regularly but not completely dilated, and tension began to rise. On account of the ulceration of the cornea I hesitated about using the tonometer. One could not view the fundus because of a more or less generally edematous cornea, and the slitlamp, for the same reason, did not afford me much information except to show that the anterior chamber was relatively deep, and that the pupil was only half dilated.

The patient was referred to his dentist, who extracted two definitely abscessed teeth, and a speedy recovery was anticipated. Instead of improving, the man's condition became worse, and he was finally referred to the Royal Victoria hospital for a complete systemic examination. It was soon noted that the urine was loaded with sugar, and a vigorous attempt was made to render him sugar free. I may say that, in spite of a progressive rise in tension, I felt it imperative to persist in the use of a mydriatic, and atropine was used four times daily. Tension with the tonometer was 47 to 50 mm. Hg., and the field of vision did not seem to be contracted. The eye was very definitely inflamed as one would expect to find it in an acute iritis. As taught me at Moorfields, I decided on doing a corneal paracentesis, opening the incision every day or two with a spatula as rise in tension warranted. All went well for about one week; but after that time, much to my horror, the paracentesis wound, due to the diabetes, became necrotic and I had to desist. The corneal incision fortunately cleared up; I tried gentle massage, still pushing atropine and maintaining a sugar-free diet. With the slitlamp, after a time, one began to get details of the cornea; posterior synechiae could be detected at a number of points, some lympth and pigment cells over the lens capsule, dots and clumps on the back of the cornea with numerous cells circulating in the aqueous.

In the course of time one could make out the details of the fundus. The optic disc was not altered, but there was a

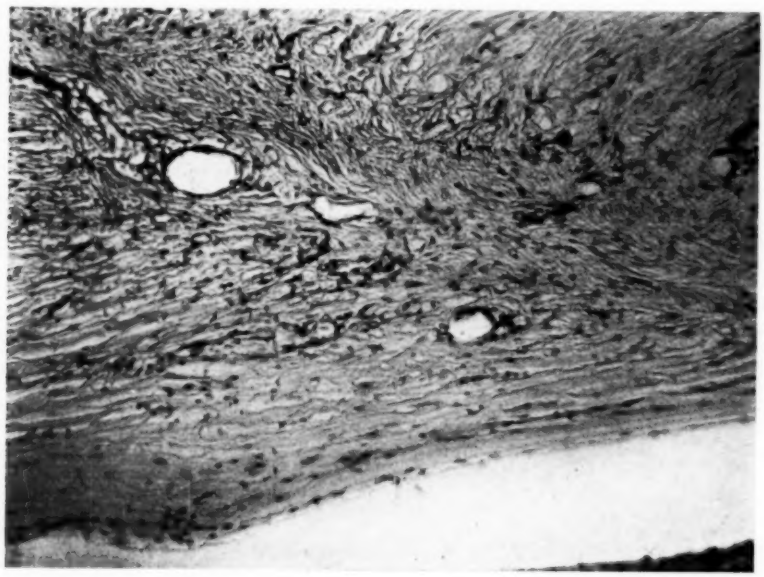

FIG. 6. A cystoid scar of the cornea. This condition might possibly have been induced by the act of repeated paracentesis, inhibiting an actual union by primary intention, as in case 4. Again, through the operation of anterior sclerotomy, as in case 5, an overriding of the sectioned corneoscleral tissue may have been brought about, assisted, no doubt, by the inclusion of iris pigment, by a fragment of Descemet's membrane, or possibly by a tiny tag of iris as noted in other sections.

small retinal hemorrhage below and to the temporal side, close to the nerve head. Tension still remained at 50 mm. The iritis was, however, subsiding, possibly under the influence of atropine, possibly under the antidiabetic treatment; but probably due to the effect of both. Massage was still maintained. The fact of taking tension with a 15 mm. weight now at times seemed to me to temporarily reduce tension. In short, the patient recovered completely. When seen over six months ago the eye was absolutely quiet, the retinal hemorrhage had disappeared, there were no cells in the aqueous, vision with a very slight astigmatic correction was 6/6, and tension was 23 mm. Hg.

Case 5: E. G., aged 56 years, had been the subject of an established septic arthritis for over twenty years, walking with difficulty from the hips, and with a definite ankylosis of the cervical vertebrae, as well as of the jaws.

When seen by me in 1917, he suffered from no discomfort from either eye, although his visual acuity only registered 6/12 with the right eye: there was full vision with the left. The reason for the defective vision in the right eye at that time could not be determined. He was examined systemically, as he had been on other occasions, in an endeavor to locate the origin of the arthritis, but with no success. In 1919 he returned with the right eye hopelessly lost from a progressive iridocyclitis which the man had absolutely neglected. The iris was plastered down to the lens capsule, tension was soft, and projection of light was faulty. Vision in the left eye was 6/6, and the eye remained quiet. In 1924 the trouble became manifest in the hitherto healthy eye. There were several punctate dots at the back of the cornea, although one could not make out any opacities in the vitreous, and no posterior synechiae were as yet apparent. Vision was 6/24, and tension was 17 mm. Hg. A winter was spent in Barbadoes without any manifest improvement. Another systemic examination pointed to the tonsils as a remote possibility, and these were enucleated. Instead of an improvement the eyes became much worse, a great many dots appeared on the back of the cornea, and intraocular tension rose to 50 mm. Hg. Atropine had naturally been employed since the eye had shown manifestations of iridocyclitis. Numbers of cells could be noted circulating in the aqueous. In August, 1926, with the persistence of cyclitic manifestations, the formation of multiple posterior synechiae, and a maintained rise in tension, a trephine operation with the excision of a large segment of iris was successfully undertaken. The cornea was split unusually well, and a two mm. trephine was used. Prior to all this, further systemic examinations were undertaken, and many repeated. The gall bladder was even drained for a problematic B. coli infection, and a vaccine made from what was surmised to be a nonspecific prostatitis. Nothing helped him. He was discharged from the hospital after his operation with a nice bleb, and a tension of 14 mm. Hg. The trephine hole plugged up owing to the continued iridocyclitis, and tension rose again. Opacities were quite manifest in the posterior cortex, and I sent my patient to Doctor de Schweinitz for help. For once he failed me. He very kindly told me that I had combed out the possibilities fairly well, and that for the present he had nothing further to suggest.

My difficulties were now multiplied by my patient manifesting an intolerance to atropine for which I substituted duboisine. Tension remaining up to 40 mm. Hg., I finally did an anterior sclerotomy through the former trephine hole. Tension has remained down at 15 mm. Hg. for the past nine months, although the lens is becoming more generally opaque. I am not anticipating with any degree of satisfaction the removal of the cataractous lens under the circumstances.

A pathological interpretation of the tissue changes involved in these several cases resolves itself, more or less, into one of degree in so far as the disposition of the tissue in and about the filtration angles is concerned. For an iridocyclitis with glaucomatous complications the pathological findings are in direct relationship to the clinical manifestations.

Cases 1 and 2 are well illustrated by the following photographs, exemplify-

ing the pathological process involved. One notes not necessarily an extensive infiltration of leucocytes in the anterior chamber, but rather the massing together or grouping of a small series of white blood corpuscles of different varieties, constituting what, for want of a better name, we are in the habit of calling "Drusen" or cyclitic dots. The product of an inflamed iris stroma as well as of the ciliary body, their presence is not lost here; but one notes their scattered elements of formation with fibrin and pigment cells, occupying the trabecular meshwork forming the spaces of Fontana, and with albuminous changes inhibiting percolation of the aqueous through the canal of Schlemm. A regulation of the function of excretion in the one case, with the removal of septic teeth in the other, with the persistent and vigorous use of atropine, in spite of tension, undoubtedly arrested the toxic condition, and consequently the engorgement in the vessels of the iris and of the ciliary body. Lymph and leucocytes, in consequence, ceased to be excreted, and a normal aqueous was permitted to filter through the channels of excretion before these were either blocked themselves, or before adhesions had taken place between the iris root and the cornea through its being pushed forward against the pectinate ligament, the result of hypersecretion and hypoexcretion of the aqueous humor.

In case 3, the solution was simple, and one that should have been recognized and acted upon much earlier. Here we were dealing with an old atrophied iris which had long since ceased to function as an inflammatory membrane. It survived largely as a mass of atrophied or scar tissue with organized lymph and pigment cells. The pupil had contracted down to its utmost limits due to the early use of pilocarpine or eserine, and was in the end absolutely unable to dilate when atropine was resorted to on account of an established ring synechia. The fact of the extravasation of lymph and pigment being manifested mostly about the pupillary margin rather than at the angle was a fortuitous circumstance when one considers the mechanical limitations of an iridectomy.

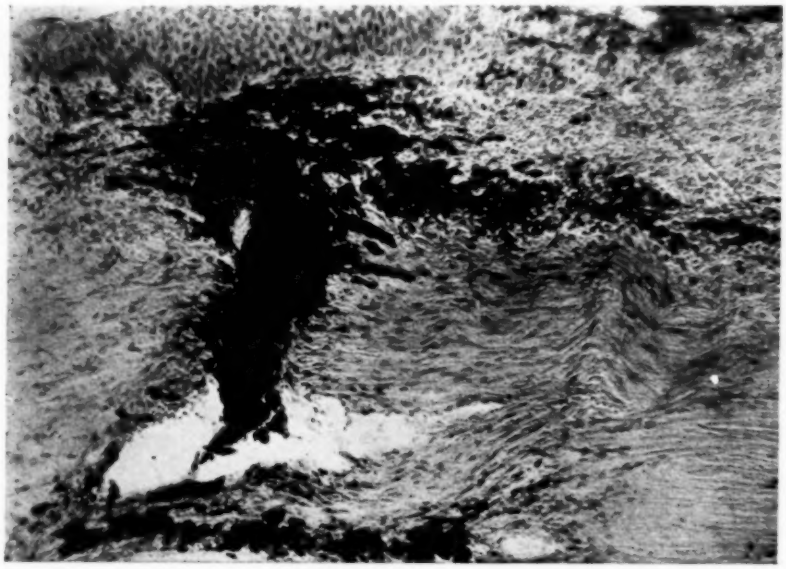

FIG. 7. A trephine operation, as in case 5, where the hole has become entirely plugged by iris pigment. One may notice, further, how well the cornea has been split and how the whole of the additional portion of the section has been undermined and the constitution of a cystoid cicatrix absolutely inhibited.

The associated condition of keratitis bullosa presents characteristic edematous changes in the basement cells of the epithelial layer. Scattered throughout these cells, some close to Bowman's membrane, are a number of lymphocytes separating this lamina from the overlying cells, as Fuchs has pointed out. At other foci are large vacuolated spaces where the edematous cells have separated, forming what are recognized clinically as blebs or bullae, some of these breaking down and throwing off their more stratified layers of cells.

In case 4, that of glaucoma due to diabetic iritis, I think that the fact of using a mydriatic from the start was largely responsible for the cure that was established. It is quite true that a surgical procedure was adopted in the form of paracentesis; yet I do not think that this surgical procedure in itself, primarily, had anything to do with the result attained, either by freeing the angle or by establishing a cystoid scar. My only conjecture is that in this case a definite glaucomatous tendency was in process of being established at the filtration angle, as well as about the pupillary margin. Whether recognized immediately as a case of glaucoma or not, its salvation lay in or was due to the fact that scopolamine was used from the start, and that in this way the iritis was combated. The paracentesis, although only serving the patient for a week, at least afforded the eye a metaphorical breathing space. It brought about a depletion of the anterior chamber from albuminous material attendant upon the iridocyclitic state; leucocytes, fibrin, and pigment cells were washed away, and a fresh aqueous was permitted to percolate through the structures concerned in the formation of the pectinate ligament and the canal of Schlemm. By this means the result of a chronic iritis was anticipated before the root of the iris could become firmly attached to the back of the cornea by organized inflammatory exudate and so constitute an established cohesion in the neighborhood of the filtration angle. One must not overlook the value of an antidiabetic régime and the use of insulin in this case.

As to case 5, that of iridocyclitis and glaucoma associated with chronic arthritis, I do not know of a combination starting as doubtless this patient's joint condition did in which such a merciless, malign, and vicious cycle of complicating factors could possibly have arisen. Systemically he had been thoroughly overhauled. One presumes, failing other information, that the source of infection had been in the tonsils many years previously. They had lately been enucleated, but the primary source of pollution had only been removed after the stream had become contaminated. The serous cavities of the joints indefinitely remained, each one of them capable of constituting a focus of infection as far as the eyes were concerned.

In desperate cases such as these, the trephine operation when done entirely in corneal tissue by splitting the substantia propria is sometimes satisfactory. Although exposing a large segment of clear cornea, and using a two mm., trephine, the result was not a success. It is true that for a couple of weeks tension remained down and all promised well. Doubtless the trephine hole became plugged and so a relapse of increased tension ensued.

The anterior sclerotomy through the former trephine hole has doubtless allayed or arrested the trouble, in a variety of possible ways. In the first place the trephine hole may again have become freed; there may have been brought about some overriding of that part of the corneoscleral tissue concerned in the trephine operation through the larger section; there may have been an included tag of Descemet's membrane, or even an inclusion of pigment cells within the lips of the wound; or possibly there may, through some fortuitous circumstance, have been an inclusion of a knuckle of iris tissue which induced a cystoid scar at the corneal limbus.

As a case for comparison with all of those to which your attention has here been directed, I should like to show one last section from a case in which enucleation had to be performed for the relief of bullous keratitis in a blind and painful eye. The condition of

glaucoma occurred at least thirty years ago, when our knowledge of the important part played by systemic infections was not fully appreciated, and before many of the various surgical alternatives now are at our disposal for the relief of glaucoma had been brought forward.

The patient, a man of national importance, had consulted the best advice available in his own, in this, and in European countries. Miotics and the operations of the time having failed, Jonnesco's procedure was finally resorted to. The failure of an iridectomy, as well as of the last mentioned surgical procedure, is easily explained by the presence of organized pigment in a deep anterior chamber, doubtless the result of an old iridocyclitis, completely blocking the spaces of Fontana and the canal of Schlemm. It is interesting to wonder what a Lagrange, a trephine operation, or one of the iris inclusion operations might have effected in this unfortunate case.

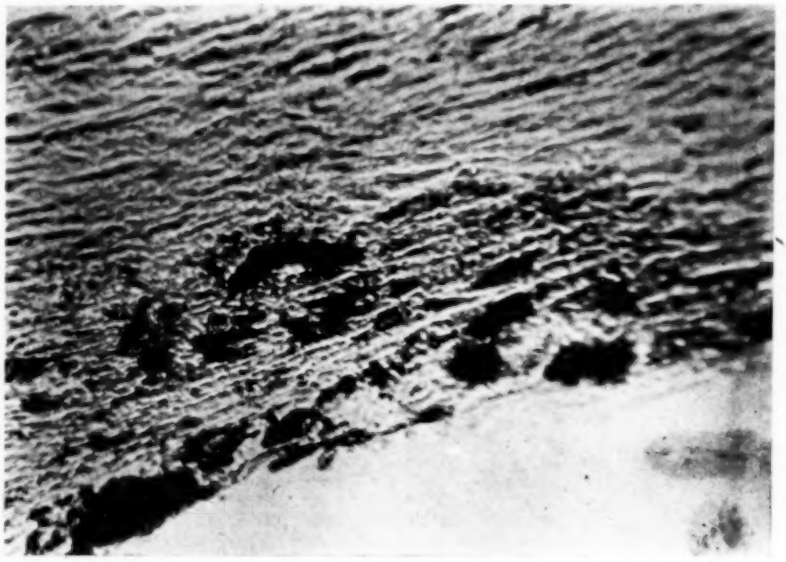

Fig. 8. A section from an eye blinded by glaucoma and removed for relief of pain. Sight had been lost for thirty years and an iridectomy had been futile. A Jonnesco operation provided absolutely no relief. The reason is clearly shown in this section by the presence of an unusually deep anterior chamber, while the canal of Schlemm and the spaces of Fontana are absolutely occluded by dense pigmentary deposits, doubtless the residue of a very old-standing iridocyclitis.

Before closing may I be permitted to make the following surmises from the case reports and specimens which I have presented with this paper regarding glaucoma of iridocyclitic origin.

1. There is variation regarding an etiological factor.
2. There is variation in clinical manifestations.
3. There is variation in pathological findings.
4. There is variation in treatment.
5. There is variation in results. These vary to a large degree in accordance with an intelligent appreciation of the complete and comprehensive pathological findings underlying the diseased condition, with a knowledge of the pathological processes which the altered physiological function may bring about. The danger of ignorance of one as well as of the other, and of consequent illogical interpretation of what operation or other form of treatment should be adopted in a given case, is well illustrated in the last slide which I have had the privilege of presenting.

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POSTERIOR SCLEROTOMY FOR GLAUCOMA

HARRY FRIEDENWALD, M.D., F.A.C.S.

BALTIMORE

Cases are reported to emphasize the occasional value of posterior sclerotomy as a preparatory step for other operations, as a procedure of less danger than other operations in acute glaucoma with very high tension, to avoid enucleation in absolute glaucoma, after injury and subluxation of the lens, and in glaucoma of early childhood. Read before the Section on Ophthalmology of the Baltimore Medical Society, October 27, 1927.

Posterior sclerotomy is an old operation. It was first applied in 1830 for the relief of glaucoma by Mackenzie. Recent textbooks indicate that the usefulness of the operation is limited to such cases as require iridectomy but in which the tension is very high. In such cases "a preliminary scleral puncture, as advised by Priestley-Smith and by Gifford, is useful (de Schweinitz)", "especially when the anterior chamber is absent and iridectomy is therefore technically impossible (cases of malignant glaucoma and absolute glaucoma)", and in "cases of secondary glaucoma in which increased pressure will apparently be of short duration". (Fuchs.) Meller (Augenaerztliche Eingriffe, second edition, 1925, p. 335) applies the operation only in cases of very high pressure which renders the iridectomy dangerous and impossible, and he states that "the operation is considered of little value because the lowering of the tension generally disappears rapidly". If we go back a few years we find that the operation had more repute. In 1910 Beard (Ophthalmic Surgery, 1910, p. 405) gave the following indications for posterior sclerotomy in glaucoma:

"1. (a) In chronic (simple) glaucoma, with approaching blindness, and other operative measures and forms of treatment have availed nothing.

"(b) In absolute glaucoma, for relief of pain, or for quieting the eye in cases where enucleation is not practicable.

"(c) In irritative primary or secondary glaucoma, with absence of anterior chamber, excessive tension, etc., either as a preliminary to iridectomy or as a last or only surgical resort for relief."

Among the members of the profession, however, we find strong prejudice which has led to general discarding of the operation. The pendulum has, I believe, swung too far. The indications for the operation are wider than those generally accepted, and in appropriate cases the operation is of real value.

A. As a procedure **preliminary to iridectomy or trephine** it is of great value in cases in which the tension is markedly raised. It is my practice to perform it not only in cases of acute glaucoma in which an iridectomy is to be done, but also in many cases of chronic glaucoma in which a trephine operation is chosen. It is not only in those cases "in which the anterior chamber is exceedingly shallow" that the preliminary operation is helpful. For it lowers the tension and prevents impaction of the lens and iris against the cornea and the wound when the aqueous humor is suddenly liberated. I was first led to try this method at the suggestion of Dr. Koller, who had practised it for many years in all cases of iridectomy for glaucoma. I may add that I have never observed any undesirable effects from the operation, but I have had occasion to regret not having performed it.

Elschnig recommends posterior sclerotomy also as a preliminary step to the cataract operation in glaucomatous eyes, and especially when there is marked swelling of the lens. I have not tried the operation in such cases.

B. Posterior sclerotomy often affords great relief **in cases of absolute glaucoma** with attacks of pain. As an example let me relate the following case:

Mrs. P. M., aged 46 years, was first seen in 1910. She presented absolute glaucoma in the left eye and markedly advanced glaucoma in the right. This was held in check for a long time with myotics. Then the patient passed out of observation for a few years, and when she was seen again in 1919 vision

was reduced to 1/200 and the tension in both eyes was very high. An attack of acute glaucoma in the right eye made an iridectomy necessary on January 31, 1922, but this did not give relief from pain, and on March 2, 1922, I did a posterior sclerotomy which resulted in marked bulging of the region but gave permanent relief from pain.

I have had similar satisfactory results from the operation in other cases of this kind. It is needless to state that the operation was ineffective in some in which relief was only to be obtained by enucleation.

C. The operation has been equally satisfactory in some cases of **secondary glaucoma** in which the common operations were not possible. In 1912, Mr. R., aged 64 years, suffered a laceration of the left eye. He had shattered his eye-glass with a nail and produced a clean wound involving the upper part of the cornea and sclera. When the blood in the anterior chamber had almost absorbed it was seen that the iris had been torn out and that the lens was cataractous. Glaucoma developed, and I did a posterior sclerotomy. He was relieved of pain and had no further trouble until his death in the summer of 1927.

In a case of glaucoma following a cataract operation the effect of posterior sclerotomy was not lasting but helped to preserve vision during a critical period. Mr. E. R. S., aged 64 years, had a combined cataract operation done on February 23, 1925. On April 5, marked rise of tension was observed (between 55 and 60 mm. Schiötz). Eserine was used without benefit. On April 8, a sclerotomy was done, and when the tension again rose it was repeated, on the 13th. The tension then remained normal, and the vision tested in November was very good, but a month later the patient returned with marked rise of tension and the iris was found markedly bombé. Under cocaine anesthesia a Graefe knife was passed through the iris and also through the membranous cataract. Since that time vision has remained satisfactory (6/12), and there has been no further trouble.

D. The operation has been of great benefit in two cases of **acute glaucoma** in which more radical procedures appeared unjustifiable. Mr. J. F. P., aged 80 years, was first seen in June, 1922. He had had acute glaucoma in the right eye, and an iridectomy had been done ten years before. He had not regained any vision after the operation but his left eye had not given him any trouble. With +4.75 sph.+0.75 cyl. ax. 180° vision was 20/15. The pupil was very small; the tension normal; the anterior chamber shallow and the eyeground apparently normal (?). (The field of vision was not charted.) The right eye showed a large irregular coloboma of the iris with a brown cataract. A year and a half later, on November 23, 1923, the patient had an attack of acute glaucoma in his left eye. Vision had been fair until the evening before, although on a couple of occasions he had had very short attacks of blurring of vision. When seen, the eyeball was scarcely congested but the tension was quite high. The anterior chamber was very shallow. The media were sufficiently clear to enable me to make out a marked excavation of the optic disc with some hemorrhages close by and very full and tortuous veins. The pupil was between three and three and a half millimeters in diameter. Eserine was used every few hours. On November 25 the patient complained that he saw colored lights. Tension was now reduced to normal and vision was about 20/100, but there was complete loss of the nasal half of the field and inquiry elicited the fact that the defect must have developed some time before. On the 27th, tension again rose and vision was abolished. I did a posterior sclerotomy, but as no vitreous appeared I made a second incision and still no vitreous appeared. On the following day his vision was found to be 20/60, and on the 13th 20/30 partly, and tension was normal. The vision subsequently rose to 20/24.

On April 23, 1925, after a year and a half interval, I was called to see the patient. Vision had been growing worse and he had a severe attack of pain with vomiting which had begun during the

night. There was a definite attack of acute glaucoma. I did an immediate puncture and the patient was relieved of his pain. But the tension rose, and on May 2, and again on May 14, I repeated the operation. The vision improved and it remained about 6/36. On January 7, I was informed that he had another attack. The patient had noticed that his sight had been growing worse for several weeks. He could no longer count fingers, and tension was very high. Eserine was instilled. On the following day an acute attack supervened. The operation was done January 8, 1926, at which time his vision was reduced to movements of the hand at about six feet. Vision improved. But in October, 1926, I found that the patient had gradually lost the sight completely. Though the tension was again high, as he was without discomfort I advised no further operation.

In this case both patient and surgeon were placed in an awkward predicament. It would have been hard to induce the patient to submit to an iridectomy after his experience with the effect of the operation on his right eye. And it would have required courage beyond what is generally necessary in dealing with such cases to have urged it. The effect of the posterior sclerotomy was gratifying, since the operations resulted in recovery of useful vision and its retention for more than two years. The loss of the entire nasal half of the field of vision which appears to have come on months before, and which reached to a point close to the point of fixation, in addition to the retinal hemorrhages observed before the operations, rendered the outlook for an iridectomy very hazardous. The recurrent attacks of glaucomatous pressure each destroyed a bit more of central vision, and yet each sclerotomy restored some.

Another case in which the result was even more satisfactory was that of an octogenarian. In 1922, when 77 years of age, he had acute glaucoma in the left eye. I first examined him two days after the attack began. His vision in the right eye was 20/38 partly, that of the left was reduced to counting fingers at four or five feet. He had used eserine several times before my examination, but the left eyeball was intensely hard. An iridectomy was performed the same day. The operation was done without difficulty, and the effect on tension was quite satisfactory. In spite of this, however, vision was not restored, and on the fifth day the ophthalmoscopic examination showed a large floating mass in the vitreous—a hemorrhage had evidently occurred. Though the tension has remained normal, useful vision has never been recovered. The patient had no further complaint concerning his eyes until August 18 of this year, though in 1924 he had suffered and recovered from an apoplexy and in 1925 had had a milder cerebral accident. On the morning of August 18 1927, he observed a blur before his right eye. This gradually increased without pain or other discomfort, and when seen in the afternoon the eye was of stony hardness, there was slight congestion, the cornea was steamy, the anterior chamber shallow, and the pupil dilated. He was able to count fingers at two feet. Eserine was instilled frequently, and on the following day tension was normal and vision "as good as before the attack."

Ten days later the media were clear, the disc normal, showing neither cupping nor atrophy; but eserine was continued. On September 6, another attack occurred. At noon he had been reading the newspaper, at one o'clock the blur appeared, and by four o'clock vision was greatly obscured; he could count fingers at only four feet, and the eyeball was intensely hard. Eserine aided by dionin was used very frequently throughout the day and night, but on the following morning the eyeball was still of stony hardness, the patient was suffering pain, and the vision was unchanged. The experience with his left eye, with knowledge of the profound vascular disease, made a posterior sclerotomy advisable and the patient submitted to this procedure on the same forenoon. The incision was not followed by any immediate lowering of tension, and it was therefore

enlarged and a small bead of vitreous allow to escape. The patient suffered no discomfort during or after the operation.

On the day following the operation the fundus could be seen and small hemorrhages were noted about the disc. The patient was allowed to return to his home on September 9 (two days after the operation). Vision slowly improved; on September 21 the patient was able to read large letters; and early in October vision had recovered so that he was able to read small type. The visual field tested with fingers appeared normal. Tension is quite normal. An ophthalmoscopic examination shows no hemorrhages at the present time. As a precautionary measure and perhaps as an indication of our anxiety, eserine is being continued.*

In this case sight has been recovered in spite of the unfavorable outlook, the resistance to eserine, and the retinal hemorrhages. I confess that I gave a very grave prognosis for the operation, and I dread to think of the probable result of an iridectomy in this case.

E. **Contusion:** One of the most gratifying cases showing the benefit of sclerotomy was that of a patient aged 49 years who was struck in the eye with a golf ball on September 5, 1925. I saw the patient on September 22. There was slight subluxation of the lens, vitreous opacities (hemorrhagic), traumatic central chorioretinitis, and increased tension (50 mm. Schiötz). Under eserine the tension was kept normal. Central vision, at first less than 20/200, gradually improved to 20/100. But the tension would rise as soon as the use of the myotic was interrupted. It was felt, therefore, that a more radical treatment was needed, and, knowing the risks of operation in these cases, posterior sclerotomy was chosen as least likely to do damage.

A free incision was made on October 15 and its effect was quite satisfactory and has continued so. Vision rose to 20/60, 20/48 partly, and the tension has remained normal. When last examined this summer, a central lenticular haze was found to have developed, and this reduced the vision to 20/200.

F. Posterior sclerotomy has proved of value in a case of **congenital excessive myopia with glaucoma.** The child was seen when two and one-half years of age, in June, 1922. The myopia was estimated at forty diopters. The anterior chamber was very shallow, while ocular tension was sometimes very high. Eserine was used persistently. In February, 1924, the child was seen in consultation by Dr. de Schweinitz, who recommended Haab's procedure of repeated posterior sclerotomies. This suggestion was followed. Only one puncture was required in each eye, and the immediate effect was lowering the tension and changing the anterior chamber from very shallow to very deep. This condition has continued. The full history of this case, which has many features of unusual interest, will be reserved for another occasion.

It is not my intention to laud posterior sclerotomy as an operation to replace the common operations, but I wish to urge its usefulness as a preparatory step in other operations, and as a procedure of less danger than other operations in cases of acute glaucoma with very high pressure and a tendency to intraocular hemorrhage, as an operation which in some cases may render enucleation unnecessary in absolute glaucoma, and especially as indicated in cases of glaucoma following injury and subluxation of the lens and in glaucoma in early childhood. In urging the operation for these conditions I desire to emphasize the fact that the operation is without serious danger and that I have seen no case in which it has done harm.

1212 Eutaw place

* Patient was seen at office November 22, 1927. Central vision $^{6}/_{12}$. Field roughly taken normal. Tension normal.

RETROCONJUNCTIVAL POSTERIOR SCLEROTOMY IN GLAUCOMA COMPLICATED BY CORNEAL OR CONJUNCTIVAL INFECTION

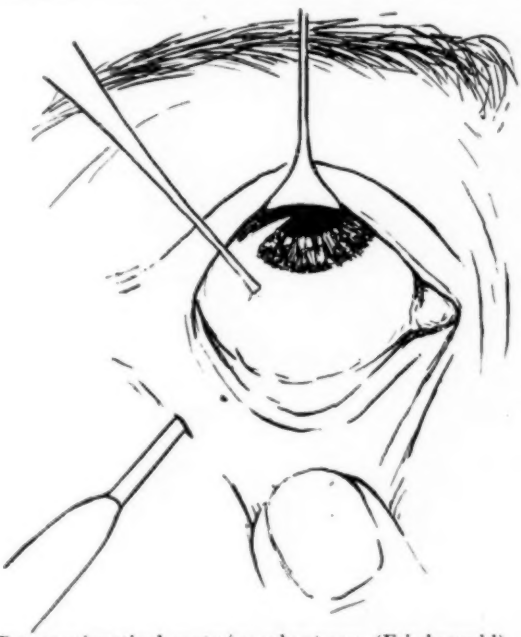
JONAS S. FRIEDENWALD, M.D.

BALTIMORE

Under general or local anesthesia, and after lifting the conjunctiva of the lower cul-de-sac out of the path of the incision, a cataract knife is introduced through the skin near the lower temporal angle of the orbit and directed toward the equator of the eyeball. The operation is particularly to be employed in the presence of conjunctival or corneal infection. From the department of ophthalmology Johns Hopkins Medical School. Read before the Section on Ophthalmology of the Baltimore Medical Society, October, 27, 1927.

The operation which is to be described requires scant argument to demonstrate its usefulness. Every ophthalmic surgeon is familiar with the tragic circumstances of cases of glaucoma with high tension, urgently in need of operation, in which on account of conjunctival or corneal infection the usual modes of operative interference are contraindicated. Medicinal measures are resorted to, often with little hope of their efficacy. If, in such cases, the intraocular tension could be reduced even temporarily, so as to give the physician time to combat the external infection, many an eye could be saved with useful vision. While the infection makes the usual operative approach impossible, the skin surface of the lids can be adequately sterilized and an incision made without entering the conjunctival sac, thus avoiding the danger of intraocular infection.

General or local anesthesia can be used. An eye speculum is not necessary.



Retroconjunctival posterior sclerotomy (Friedenwald).

The skin surface about the site of incision can be sterilized with tincture of iodine. While the assistant holds down the lower lid with his finger the operator grasps the conjunctiva near the lower temporal limbus with a fixation forceps. By taking a large bite of conjunctiva with the forceps the lower cul-de-sac is lifted up out of the path of the incision.

A cataract knife with a long blade is now introduced through the skin near the lower temporal angle of the orbit

and directed toward the equator of the eyeball in the lower temporal quadrant. The blade is at first held so as to make the skin incision parallel to the fibers of the orbicularis muscle. When the resistance of the sclera indicates that the eyeball has been reached the blade is turned into a meridional direction in relation to the globe. Care must be taken not to plunge the knife too deeply into the eye, for the blade is pointed farther forward than in the usual procedure and may easily injure the lens. After the sclera has been penetrated the blade is turned through an angle of ninety degrees so as to make a T-shaped or cruciform incision. After withdrawing the knife a collodion dressing can be applied to the skin. The eye requires no dressing.

The operation is easy to perform and may be repeated if necessary.

1212 Eutaw place.

RELATION OF OPHTHALMOLOGY TO PREVENTION OF BLINDNESS

EDWARD JACKSON, M.D., F.A.C.S.

DENVER

The influence of the effort to relieve and prevent blindness upon the development of ophthalmology is here traced. The causation of blindness through neglect of various eye lesions is pointed out. Address delivered before the joint meeting of the Chicago Ophthalmological Society and the Illinois Society for the Prevention of Blindness, October 14, 1927.

Human beings have understood the calamity of blindness. The Greeks did not agree where Homer was born, they did not agree whether he lived 800 or 1200 B.C., but they all agreed that he was the "blind poet of Greece". In Egypt, when the "Book of the Dead", the Ebers papyrus, was written, the part on the eye was by a specialist. He wrote the oldest account of ophthalmology that has yet come to our knowledge. About the same time, 3500 years or longer ago, the code of Hammurabi, unearthed at Nineveh, told of the penalty for causing blindness, or for blindness ensuing on treatment.

Tracing the history from the earliest time that we can recognize it up to the present day, blindness has fixed the attention of young people upon the function of the eye, the dangers to the eye, and the importance of means to guard against those dangers, to preserve the most important sense that human beings have. It is unnecessary to trace in detail what has been the development of ophthalmology. But, at many points, it has been clearly the reaction of human intelligence and human sympathy and desire to the calamity of blindness.

We have gone on from the early development and treatment of ophthalmias, from the treatment of cataract, attempted and done with more or less success in India probably for five thousand years, through the serious conditions that attracted the attention of the Greeks; and the whole history of ophthalmology brings us, again and again, in contact with the problem of blindness, or the problems that spring out of blindness, for there are many of them. Trachoma was evidently one of the most distinctly recognized diseases of ancient Egypt. We still have it in our catalogue of important causes for blindness.

The Greeks recognized strabismus, but it is notable that nothing was done for the treatment of strabismus until in the last century it was found that the squinting eye had poor sight, and that strabismus in many cases was responsible for the poor sight. Today the argument of the importance of saving the sight of the eye, making it as useful as possible, giving it the best chance for development, is the strongest argument that we have to urge for the operative treatment of strabismus.

Cataract and gutta serena, blindness where there was not a cataract, were known from ancient times. When modern ophthalmology had its birth seventy-five years ago in the use of the ophthalmoscope, one of its first important applications was for discrimina-

tion between cataract and the diseases causing blindness that had been confused with it; particularly, as we know now, glaucoma, atrophy of the optic nerve, and lesions of the retina.

The end is not yet. We have seen the application of biomicroscopy. Most interest has been aroused in this new application of the microscope to the living eye, because of the light it seems likely to throw on pathological processes that still lead to blindness. Professor Koeppe's demonstrations called special attention to the nodules in the iris which, he taught, showed either syphilis, tuberculosis, or sympathetic ophthalmia. We do not all agree that this is the case; but the fact that these were given as an evidence of diseases that are marked by great danger of blindness surely added to the interest of his demonstration.

The time has come when the old order of attack in medicine is giving place to the new. The management of active and particularly of acute disease, the operations to remove disease, are giving way to the prevention of such conditions. As our vision extends farther, as we see farther ahead in the prognosis of any case of disease of the eye, it is perfectly natural that we should pay more and more attention to prevention. Blindness has made its impression on the general consciousness of civilized nations, arousing sympathy, awakening the desire to help, in all sorts of people and in all possible ways; and, responding to the same influence, the medical profession is working more and more for the prevention of blindness.

Ophthalmology is so closely intertwined with the history of our knowledge of blindness in the past that we should see, in this present stage, the outlook for the prevention of blindness. How wide the opportunity is can only be appreciated by reflecting on the problems that today are involved in such prevention.

In the program of this meeting we find, as a first item, bacterial invasion, a menace to the newborn. The bacteriology of ophthalmology is just opening up. Within a very few years we have seen a new light thrown upon it by the work of Lindner with regard to trachoma and other conjunctival infections.

Then comes the state's function in promoting prophylaxis in the eyes of the newborn. We heard yesterday an interesting account of the first assumption of that function, from Dr. Lucien Howe, one of the men who were active in bringing forward the prevention of ophthalmia neonatorum to a recognized place in law, and a recognized place in public health policy; this opening up in other directions the eyes of the seeing to the necessity for the prevention of blindness. Next we find syphilitic eye tragedies and their prevention by early treatment. Can any ophthalmologist read this program and not feel that everyone of these subjects implies great fields for advance and development in ophthalmology.

We have new light thrown on the development of the eye and all the relations of that development to sight by the talk given before the illuminating engineers yesterday afternoon, on "How we learn to see and how we learn some other things".

Then comes the intensity of light, and speed and vision study with reference to industrial situations. Then the "four mental factors" in seeing suggested to most ophthalmologists a new point of view.

This morning we dealt with the prevention of industrial eye injuries. That is as practical as any subject that can ever be brought to our attention; one we come in contact with in everyday practice.

This afternoon there was opened up a line of work for the prevention of blindness in which ophthalmology must lead, if advance is to be made. That is, the care of the eyes of school children, the detection of defects, the importance of giving the child, perhaps with minor defects, a fair chance to use his eyes and succeed, in this civilization which rests on vision. All that, if it is to be healthy development, must be guided by the knowledge of those who have studied ophthalmology, who are more interested in it than anything else, and who are ready to help the public in their efforts to prevent blindness.

The morning given over to "sight-saving classes" introduces a different aspect of protection of the eyes of the young, helping those who had not a fair start to overcome the handicaps that were laid upon them and to take their part in life. After a luncheon conference we come back to the old problem of Egypt, the trachoma problem, very much the same problem for us as it was in the days of 1500 B.C.

We have had a wonderful advance in the last fifty years with reference to the treatment of injuries, with reference to the understanding of the causes of inflammation following trauma, and the control of the results of such injuries. But, among those familiar with the ophthalmology of today, who does not feel that instead of having achieved the goal, we are just starting toward it; perhaps getting merely a glimpse of the pathway that leads in the right direction?

Our knowledge of infection, based on our knowledge of bacteria, and on the observance of symptoms by the most exact methods, is preparing us to treat injuries and the results of injuries better than they have been treated heretofore. You who are in ophthalmology know that blindness which comes from injuries depends half the time, at least, upon the sequels to the injury, upon the infections, and at every step the case presents the problems of therapeutics. Improvement of all ophthalmic therapeutics must go on if we are to do a proper share in the work of preventing blindness.

The prevention of blindness is not concerned much with those who have become blind; but an understanding of how others are to be protected from this calamity may be based on statistics of blindness as it now exists. At what time of life do people become blind? We can take figures from the statistics of the census of 1910 for the United States which were rather carefully worked up, although they may not be entirely reliable. The number of blind under one year of age is set at one-tenth of one percent of all the blind in the community; under five years of age at one percent of all the blind in the community. Three and nine-tenths percent of all the blind population have become blind by twenty years of age.

But remember that throughout life the number living at any particular age is growing less. The mass statistics with reference to blindness show that rather over one-half of the blind in a community are over sixty years of age.

Under one year of age there are thirty-two blind for each million of population; under five years of age, fifty-two per million. At twenty years of age the number has risen to 243, at forty years of age to 396, at sixty years of age to 1326, at eighty years of age to 4,589; and over eighty-five years it would be 25,748 out of one million who reached that age. The falling number of population and the rising percentage of blindness become very impressive when considered together.

The average age of the general population is set down at twenty-four years. The average age of the blind is 59.6 years. Sight is lost in the great mass of cases through attacks of disease, by transgression of the laws of health throughout life. Blindness is the summing up of strain, injury and disease that have gone before, and when that fact is fully recognized by the ophthalmologist it must carry with it a sense of responsibility.

Interstitial keratitis, or the scars of phlyctenular keratitis, frequently, by the degenerating processes of nutrition in later life, become more and more obtrusive and serious. I have seen where there was a clear history of phlyctenular keratitis in childhood, scars in the cornea that were scarcely noticeable up to sixty years of age but became very marked after that and could be as much a cause of senile blindness or impairment of vision as cataract is in the average case.

There are probably other lesions acquired early in life that pass through similar stages, and become of practical importance only many years after they occurred and often after they have been forgotten. Glaucoma is often inherited. Liability to cataract is inherited. The danger is a congenital characteristic of the particular individual, and yet these things only develop, we only become conscious of

them, in the later part of life. Optic atrophy may rest on a cause many years back; with no manifestation until the changes of age progressively slow down nutrition, lessen the power of repair, and produce complete blindness from atrophy of the optic nerve.

Up to 125 years ago, smallpox was one of the common causes of blindness throughout the civilized world. It is still a cause of perhaps eight to twelve percent of blindness in some countries that have pretty good statistics on the subject, but do not have enforced vaccination.

In the southern part of Colorado we have quite a large Mexican population; and from them, where vaccination is often omitted, we get today a certain number of cases of blindness from **smallpox.** One of the most striking cases that I have ever encountered was when I went on duty at the Denver General Hospital several years ago. An old woman was very anxious to see me, I was told. She had come in during the three months of my predecessor's service. In the three months that I was on duty I never went to the hospital that she was not anxious for me to see her and see if something could be done for her sight. She was seventy-five years old and had never been vaccinated. She had taken smallpox, both of her eyes had suppurated, and the sight was entirely lost.

That sort of case occurs so unusually now, that in order to get the full benefit of it and to do justice to the age in which we live, the example must be emphasized. Seventy-five years, when at any time immunity could have been had and the danger avoided, were passed without obtaining protection. How many other cases of blindness do we encounter in which likewise a very long period has passed, when careful study of the case would have shown dangers to be avoided, and in the end the omission of such study results in the blindness of old age.

A few years ago I had occasion to go over several hundred cases of **cataract** in their different early stages. Those had been under observation for several years. My conclusion from the history of those cases was that on the average it was about twenty years from the time that symptoms of cataract, limited opacities, are clearly detected in the eye up to the time of blindness from cataract.

There are constantly, perhaps, in every community, seventy-five percent of the people who are over seventy years of age that have had some start of cataract, and yet they need not, in the great mass of cases, ever come to the issue of an operation, or to blindness; because most of these cases depend on causes that can be detected and removed. One of these causes, a very common cause, is eye-strain. The lack of appreciation of the importance of **eye-strain** is responsible for a certain number of cataracts. I have frequently noticed people who came unusually late for glasses, perhaps fifty years or even older before they would wear glasses for near work, who had signs of cataract; and then, after the wearing of glasses and care of their eyes, the evidence of cataract never increased, or increased so slowly that the patients went on five, ten, or fifteen years after it was detected, and never were seriously inconvenienced by the change in their eyes.

I mention these things because in our daily practice we are coming in contact with very large numbers of people, who are possible subjects of future blindness. In fact, the mere theory of probabilities would show that a large number of them will become blind at some time, and they will become blind from accumulated damages to their eyes that might have been avoided, or the consequences largely escaped. Does not that place upon everyone who undertakes to advise with reference to the care of and treatment of the eyes an enormous responsibility for the future prevention of blindness?

This matter of eye-strain suggests one common following after false gods that we are guilty of in common with other branches of the medical profession, and that is the importance we attach to operations and their immediate visible results, as compared with, say, the importance of giving the patient the right glasses so as to avoid eye-strain.

A few years ago I saw a patient who had advancing cataract, but had been able to use his eyes and keep on with his business, by keeping his pupils somewhat dilated. Then he told me he was going to Europe and wanted to consult some famous ophthalmologist there. I gave him the name of one. I did not see him for a couple of years afterward. He went to one of the most famous operators in the world, and had the cataract removed. He did not entirely like the way he was treated there, so the next year he went to another very famous operator in Europe and had the other cataract removed. I saw him about a year and a half after he came back. He was dissatisfied.

The extractions had been done with iridectomy and capsulotomy, and the results were as beautiful as I ever saw. But his vision was only one-third, and he had had exceptionally good vision before he developed the cataracts, and he was not satisfied with the result. He had been given glasses only a few weeks after the operations. Probably they were given with the idea that they would be changed subsequently; but the glasses had given him only one-third vision. When he came back to me, his beautiful extractions, with the correction of his astigmatism, gave him 1.3 vision in each eye. That rise from 0.3 to 1.3 was just as valuable to him as to anybody.

A woman who had applied for a blind benefit in Colorado had been advised to have her cataracts removed. She went to one excellent ophthalmic surgeon and had one cataract removed. The eye became infected and was lost. Still the temporary improvement of vision induced her to go to another surgeon, also of large experience and skillful. He removed the other cataract, and this time the result was more fortunate, there was no serious infection. Both of these surgeons were ready to operate for cataract, for this patient who could pay nothing for it. But after the cataract had been removed, it was a somewhat difficult case to get the right glasses for, and the surgeon who had been so successful in the operation "could not do anything more for her sight". He felt it was not worth while to try to fit glasses. Therefore, she was sent out with vision of 1/10, enough to go about, with the glass that she had. The correction of her astigmatism gave her between 4/10 and 5/10 vision, enough to do ordinary reading. It raised her from the level of the practically blind to fairly good vision. Her gratitude for that improvement in vision was as great as for a good cataract operation.

We need to be turned away from the spectacular things in the practice of ophthalmology, to the watching of minute details; and, perhaps, to the watching of cases over long periods. The care of little things, properly attended to in the earlier years of life, will prevent life from ending in blindness. That is the important lesson that blindness has still to thrust upon us, to bring to our attention; to enforce our interest in it and so develop ophthalmology to a new efficiency that will really make blindness rare and rather a thing of historical interest.

There are other things that should be mentioned; such as **myopia** and **retinal detachment.** The cases of myopia that go from bad to worse are, in my experience, cases of neglected refraction. They may sometimes have gone so far at an early age that glasses alone would not be sufficient, but the myopia school, the school adapted to defective sight and to the eyes that cannot stand the general school strain, must assist them. Cataract and detachment of the retina, belonging to late myopia, are as preventable as any other form of blindness, or any other form of serious disease. But prevention depends on close watching and long care to avoid them.

Glaucoma. There are many varied elements in it, and glaucoma has a bad reputation. We have had a great deal of reason to feel hopeless about cases of glaucoma; and when they are recognized we are glad if they will go to somebody else. But there are cases which show that glaucoma can be permanently controlled and cured. I have in mind a patient who came with one eye blind from glaucoma, the other with attacks of acute glaucoma that had been going on for a considerable

time. The blind eye finally was operated on for hemorrhagic glaucoma. That patient had been going perhaps twenty years after the age of presbyopia and inadequate glasses, and yet trying to keep on using her eyes for sewing and reading. When the issue was forced, by this eye going blind in glaucoma, one of the things immediately done was to give her the right correction; and the removal of the constant strain permanently checked the glaucoma in the remaining eye. At first we used miotics, but after that we stopped them entirely, and the patient lived several years without any renewal of glaucomatous symptoms, and without any operation on the surviving eye.

In the problem of glaucoma there are many elements, some of the most important of which we do not yet understand. But the things that we have learned about prevention teach us to expect great gains in this particular disease. Other sources of glaucoma are untreated or poorly treated inflammations of the uveal tract. Every inflammation of the uveal tract raises the liability to blindness, whether it is from syphilis, from tuberculosis, or from focal infection of other kind. We are only just beginning to know the causes that lie back of such inflammations, and, in looking to them, to see our opportunity for prevention of the sequels.

A good many of the cases of damage to the eyes in early life are connected with the acute dangers of contagious diseases; measles, occasionally mumps, chickenpox, scarlet fever. Measles, scarlet feaver, and spinal meningitis have particularly bad reputations in that direction. This raises the importance of the proper treatment of those cases at the time they are acute; and the final result will depend on the wisdom and persistence of that treatment, by ophthalmologists and by general physicians.

Tumors, parasites, senile degenerations, tuberculosis are all things that run a course of years; and all likely to end in blindness. The early recognition, the early diagnosis, the willingness to take the responsibility of foresight, and apply effective measures now rather than wait, would often prevent blindness. That is the direction for the future development of ophthalmology—that, and conscientious thoroughness in what we undertake to do, and the willingness to follow up and learn from ultimate results the new lessons that they can teach.

217 Imperial building.

SIGHT-SAVING CLASS WORK FROM THE STANDPOINT OF THE OPHTHALMOLOGIST

E. V. L. Brown, M.D.

CHICAGO

Certain medical considerations in connection with sight saving classes are dealt with, namely, the degree of vision or lack of it which should allocate the pupil to a sight saving class, what ocular disturbances other than those of binocular central vision should determine such allocation, and whether a child with a remediable eye defect should be excluded from the class if the parent refuses remedial treatment. The causes of defective vision in Chicago sight saving class pupils are tabulated. Read before the annual conference of the National Committee for the Prevention of Blindness, held in cooperation with the Illinois Society for the Prevention of Blindness, at Chicago, October 13 to 15, 1927.

There are no new principles involved in sight-saving class work; only an ingenious combination of well known medical, social, and educational procedures molded into a practical and happy educational device.

The outstanding medical feature is that eyes which cannot read ordinary school book type can read type enlarged so that letters such as T L O are about 3/16 of an inch in size. Regular text books are printed in this enlarged type, the same books as used by pupils who have normal sight.

The outstanding social principle involved is that physically handicapped children should not be needlessly segregated from others of their age and social group. The blind pupil must of necessity, unfortunately, remain segregated from other pupils throughout his day's school work, but the sight-saving class pupil merely needs the enlarged type, more light, more room, and more of the teacher, than the ordinary pupil. This is secured largely by north light, movable desks, and the assignment of only twelve or fifteen pupils to the room teacher, instead of from thirty to fifty. Pupils of all ages, six to seventeen, then study and prepare their lessons from the enlarged type, maps, charts, and so on, under the guidance of the teacher in this room, but go to rooms all over the building for recitation with the pupils who have normal vision. Teachers require certain special training for this work, and for a number of years the National Committee for the Prevention of Blindness and other agencies have sponsored courses of training of this nature, so that a goodly proportion of the sight-saving teachers have been specially trained. All considered, there does not seem to have been much greater difficulty in fitting this special work into the general educational system of this country and of England, where the classes are known as myope classes, than has been the case with classes for the undernourished, crippled, tuberculous, mentally deficient, blind, or deaf children, all of which thrive. As with them, space, apparatus, and teachers cost the public more. But classes for the blind cost much more, and for the considerable number of children who cannot see well enough to read ordinary print there is no other alternative except the school for the blind with its unfortunate but apparently unavoidable social and educational shortcomings.

Medical Considerations

Sight-saving class work was introduced into Chicago in 1919 by the Illinois Society for the Prevention of Blindness, and my experience with it as an ophthalmologist began at that time*. The first question was, and I think still is, What degree of vision or lack of it should allocate the pupil to a sight-saving class? Standards were not then well established, and in conference with Dr. Wm. H. Wilder, Professor of Ophthalmology, Rush Medical College, a corrected vision of 20/60 to 20/70 was adopted as the dividing line between regular school work and sight-saving class assignment; and, although each case must be and has been decided on its merits, this standard has

* Through the far-sightedness and wholehearted cooperation of Mr. John B. Curtis and Frank G. Brunner, of the Chicago public schools, the Board of Education has generously provided the many special teachers, the rooms, and the equipment needed for this work as rapidly as it grew, from 1919 on.

continued to be used by the Illinois Society since then.

A second consideration is, What eye *conditions and disturbances, other than those of binocular central vision*, should determine the assignment of the pupil to the sight-saving class? Everyone concerned, pupil, parent, teacher, optometrist, and oculist, at once recognizes that the eyes of any child with severe inflammation of the front of the eye, redness, secretion, and other symptoms, will be damaged by assignment to sight-saving, as to any other class work. But there are many low grade chronic inflammatory and degenerative conditions within the interior of the eyes which only the physician can recognize, and no child should be assigned to this or any other special class except upon the advice of a legally qualified physician. Any other course can only lead to the eventual rejection of the work by the public.

A third question is, Should the child with a remediable eye defect be excluded from the class if the parent refuses to have this defect remedied? Some years ago I made an examination of two hundred and twenty-five pupils in the Illinois State School for the Blind at Jacksonville, and found nineteen congenital cataracts for which I advised operation. The parents had doubtless previously had and refused the same advice, and the pupils are probably still blind. Cases of this kind are not infrequent. There are undoubtedly two sides to the question. But personally I do not feel that the pupil should be excluded, because legal compulsion in a matter of this kind constitutes unwarranted interference with individual liberty.

Medical Results

Some forty-four of the first one hundred and fifty pupils entering the Chicago sight-saving classes were examined by me personally in 1919, and many of them were reexamined again and again by me in the next three or four years. At that time I summarized my findings in a short paper before the Chicago Ophthalmological Society, and could conclude that: (1) no child had suffered any detriment to his eyes as a result of the sight-saving class work; (2) all, or nearly all, the children had been able to maintain their places in school and be promoted with their grades; and (3) a good number had been able to resume full work with normally sighted pupils with the regular rooms, teachers, and books, although there had been no marked improvement in their central vision.

Causes of Defective Vision in Sight Saving Class Pupils

These are much the same as the conditions usually listed as causing loss of vision in children in classes for the blind, only the loss of vision is not so extensive. Yet in the Chicago figures, there is a notable lack of ophthalmia neonatorum, optic atrophy, and congenital glaucoma, and a high incidence of myopia, cataract, interstitial keratitis, and "hyperopic astigmatism".

The first Chicago class opened in 1919 with six pupils, and at the end of each successive year the total registration for the year has been respectively 46, 59, 75, 105, 143, 168, 190, 253. At the beginning of the present school year, 1927–1928, there were 192 enrolled in eighteen classes in twelve schools. The conditions considered to have caused the loss of vision are recorded in 94 sight-saving class pupils and in 42 out of a total of 65 Braille class pupils, and are here arranged in parallel columns for what comparison may be obtained in so limited a number of cases.

	Sight-saving class pupils	Braille class pupils
Ophthalmia neonatorum	1	10
Congenital cataract	13	8
Congenital glaucoma	1	5
Myopia	19	2
Interstitial keratitis	10	1
Hyperopic astigmatism	26	1
Optic atrophy	3	9
Dislocated lens	4	0
Corneal ulcer	4	0
Albinism	3	0
Nystagmus	6	0
Injury	2	2
Strabismus	2	0
Retinitis pigmentosa	0	1
Microphthalmus	0	0
"Illness"	0	1
Amblyopia	0	1
Totai	94	42

122 South Michigan boulevard

CYCLOPLEGICS IN REFRACTION

DAVID W. WELLS, M.D., F.A.C.S.

BOSTON

Exception is taken to the opinion, rather freely expressed during a discussion at the London conference, that a greater amount of hyperopia can usually be found without than with cycloplegia. A questionnaire elicited the fact that the great majority of leading American ophthalmologists used cycloplegics as a general rule in their younger patients. Read before the Section on Ophthalmology of the American Medical Association, May, 1927.

The necessity of using cycloplegics in measuring the refraction of children, young adults and some of maturer years, I assumed, had been settled many years ago. The only question about which there was supposed to be a difference of opinion was at what age it might be safely omitted.

Less than a year ago I was surprised to learn that several of my colleagues were prescribing for children and youth on one examination without doing this.

When the transactions of the London Convention of the English Speaking Ophthalmological Societies were received, I read with surprise the paper by Burdon-Cooper[1] on the behavior of the crystalline lens system in artificial cycloplegia and its influence on the refraction of the eye. He stated that the "total hypermetropia under atropine is less than the manifest when the eyes are tested binocularly without atropine". He assumed that "this phenomenon is due to some forward displacement of the lens system as a whole".

In order to test this statement from my own records, I have tabulated the data in 262 consecutive cases, 137 under atropine cycloplegia and 125 under homatropine cycloplegia. In only five was the hypermetropia less or the myopia more under cycloplegia than before the drug was used. It is cheerfully admitted that in many of these cases the binocular fogging method was not used, but it is evident that it could not have changed the result enough to substantiate Burdon-Cooper's statement.

Probably everyone has observed patients who manifested more hypermetropia some years after a cycloplegic had been used than was manifest under the cycloplegic. This would show either that the cycloplegia had not been complete or that the eye had become more hyperopic. Time can produce much change in a living organ.

Although not definitely stated in report, it must be inferred that Burdon-Cooper advocated omitting cycloplegia in refraction, as it was this phase of the subject that was brought out in the discussion. The argument was based on the assumption that the only object of cycloplegia is to make the patient accept more plus or less minus.

Davis of New York agreed that "Burdon-Cooper's method gives better refraction correction than any cycloplegic", but said that "he used atropine in children and squint cases". Herbert, Brailey and Traquair agreed with Burdon-Cooper in omitting cycloplegia. Crisp* of Denver agreed, "assuming that one had worked out the astigmatism". Harrison Butler agreed, and said that the same phenomenon was true of homatropine cycloplegia. This Burdon-Cooper had previously denied. Hawley of Chicago said that the proper correction of astigmatism was more important than the exact amount of either hypermetropia or myopia, and that he used homatropine.

Of the six discussers, four agreed with Burdon-Cooper in the uselessness of cycloplegics in general, Davis allowing that he used atropine in children and squint cases, and Hawley stressing the greater importance of correctly measuring the astigmia, stating that he used homatropine.

* In the discussion of this paper Dr. Crisp said that the writer had been misled by the published report of the London Conference, in the form in which it came to the notice of the writer; that he (Dr. Crisp) did not say that cycloplegics are useless; and that he "uses homatropine in the great majority of his cases".

According to the Transactions, ninety-four ophthalmologists from this side of the water attended the convention. I do not know how many of these were present at this particular session, but not one is reported as definitely objecting to the statement that cycloplegics are useless.

Feeling that a great change of opinion, which I had missed, must have taken place, I made a search of the literature that was at hand. This included:

Transactions of the Section on Ophthalmology of the American Medical Association, back to 1903.

Transactions of the American Ophthalmological Society, back to 1916.

Transactions of the Academy of Ophthalmology and Oto-Laryngology back to 1912.

Archives of Ophthalmology, back to 1912.

Ophthalmic Year Book, back to 1912.

Only a few writers were in favor of omitting cycloplegics. Weill[2] says:

"While admitting that in competent hands, under absolute cycloplegia, the skiascope is mathematically more exact than is the ophthalmoscope in equally competent hands, even with the aid of the ophthalmometer to estimate the corneal astigmatism, and the trial lenses for the subjective test; I believe that the ophthalmoscope, ophthalmometer and trial lenses without a cycloplegic will give equally satisfactory results as a rule".

The reviewer adds:

"Sufficient space cannot be devoted here for a complete discussion of refraction with all that it involves with and without a cycloplegic; the overwhelming majority of American ophthalmologists are agreed that a cycloplegic is necessary, as a rule, in young subjects to obtain an accurate measurement of the static refraction, and that there are too many pitfalls in the way of measuring the same when the accommodation is active; this applies to the determination of the spherical element, hyperopic or myopic, and to the astigmatic both as to its degree and the direction of the principal meridians".

Pond[3] asserts that he finds that "it is not necessary to use a mydriatic in any case of refraction"; that "one never prescribes the correction found under atropine, and homatropine does not act long enough to be of much use"; "refraction is not an exact science, and that the same patient will receive a different prescription for glasses, and all good, at the hands of different expert refractors"; that "the accommodation relaxes in the dark room when the glance is directed at a distance". He reenforces these statements by referring to more than 8,000 refractions of his own which gave better results without a mydriatic than with one; and of course, he emphasizes also the loss from business when a cycloplegic is used.

In the opinion of the reviewer, every one of the foregoing statements is misleading, except as to the necessity of giving up the use of the eyes under a cycloplegic (hardly two working days when homatropine is used, and even in such a case if use of the eyes for near work is absolutely indispensable a pair of convex lenses will tide over). If generally acted on they would lower the high standard for which America is noted in this department, and work to the hurt of the profession as well as the public. I consider it amply demonstrated that neither the degree of the general refraction nor the amount of the astigmia and the direction of the principal meridians can be certainly determined in a large percentage of young persons unless the accommodation is suspended; and that one can never be sure in any case possessing active accommodation that this is really at rest, unless that function is temporarily paralyzed.

Stirling[4] reviews the Burdon-Cooper paper, stating that he has "observed that the binocular altered the uniocular examination, and often gave as high a plus glass and as low a minus as did a cycloplegic". He, however, continues to use cycloplegics, not atropine but homatropine and cocaine, and states that "a higher plus or a lower minus

will often be taken with the mydriatic than binocularly without it".

The following questionnaire was sent to 250 leading ophthalmologists. The list included the American Ophthalmological Society and the New England Ophthalmological Society.

1. Do you prescribe glasses for patients under seventeen years of age without using a cycloplegic?
2. If without, in what proportion of cases?
3. What drugs do you use, and in what strength?
4. Do you have patients return for postcycloplegic examinations?

One hundred and forty-nine answers were received. To the first question, 123 answered "no" and twenty-one answered "yes". The question was intended to refer to new patients, not those who had been previously examined, and the answers have been so construed.

Included among those who said "no" to this question are those who said "rarely", "with few exceptions", and "only in high myopia".

The "yes" group includes those who so prescribe in from 75 to 90 percent of their cases.

Five said "Yes, in about 50 percent".

As most of the answers to the third question did not state in just what cases the different drugs were used, the only information which admits of tabulation is that given in regard to the strength of the drug.

Of the 114 answers to the fourth question, ninety-five were "yes" and nineteen were "no". The "yes" group included seventy-one who replied "practically always" and twenty-four who replied "half the time".

After getting this information, although I find myself in accord with the majority, it seems in order to bring this subject before this representative society, so that the minority may give us the benefit of their experience, as among the number are many whose opinions always command attention.

Examination.—In my own practice, I make three examinations:

First examination: I observe the vision of each eye, the size of the pupil (north light) and its reaction.

Strength of Drugs Used

Drug	Strength, percent	Number using it
Atropine	1	48, majority
Atropine	from 0.5 to 1	11
Atropine	0.5	15
Homatropine	from 0.5 to 1	10
Homatropine	1	14
Homatropine	2	37, majority
Homatropine	3	5
Homatropine	4	4
Homatropine and cocaine*	..	10
Scopolamine	from 0.1–0.2	4
Scopolamine mentioned with atropine and homatropine	..	8

A direct ophthalmoscopic observation is made and the keratometer reading, subjective refraction, phoria, duction, p. p., and convergence near point are noted. If the patient is under seventeen years, and frequently with older patients, atropine, 0.5 percent, is prescribed, to be used at home three times: first, at 5 p.m., second at bedtime, on the day before the examination, and third early in the morning of the day of the examination, when the appointment is in the forenoon.

Second examination: This is made when the eye is under atropine cycloplegia, and consists of testing the cycloplegia, noting the vision in each eye; ophthalmoscopy; skiascopy of the central shadow, and subjective refraction, a diaphragm with 4 mm. aperture being used. This point is believed to be of great importance. The peripheral parts of the cornea show so much aberration that theoretically the patient should look through an aperture of the same size as his normal pupil, but there is some difficulty in finding a hole in a diaphragm smaller than 4 mm. Even with this size it is usually necessary to caution the patient "to look around and find the hole exactly".

With Dr. Hawley, I believe the exact measurement of astigmia the most important, and it is always reassuring

* Being curious to know why cocaine was used, I asked one of the users for his reason, and the following reply was received from Stirling of Atlanta: "Because cocaine increases the dilatation by (a) stimulating the nerve ends in the dilator iridis, and (b) by increasing the permeability of the cornea".

to note the keenness exhibited by the paralyzed eye in recognizing the amount and axis that give the best vision.

In young adults, aged approximately from 18 to 30 years, the second examination is usually made when the eye is under homatropine cycloplegia. Homatropine, two percent, is used at the patient's second visit, the office nurse instilling one drop in each eye every ten to fifteen minutes until cycloplegia is secured. Each eye is tested separately, as they often react quite differently.

The examination proceeds in the same way as with atropine, the patient returning for final test the second day after the homatropine was instilled. If five applications of homatropine, two percent, fail to produce the desired result, atropine is started and the patient is examined the following day.

In patients over 35 years of age a cycloplegic is seldom used, unless dealing with a troublesome case, with failure to obtain relief from previous ophthalmologists. In these cases the tension is always taken, and, though normal, the patient is kept under observation with pilocarpine or physostigmine (eserine) until the pupils are normal or nearly so.

This routine of cycloplegia applies to the first examination of a patient. With the static refraction on record, cycloplegia is seldom repeated unless much time has elapsed or further complications have arisen, like increasing myopia.

Third examination: The patient returns in one week for the postcycloplegic test if atropine has been used, and the second day after examination under homatropine. If cycloplegia has passed, the third examination is proceeded with, even though there may be some mydriasis, in which case the 4 mm. aperture is used.

The prescription. Now, with all this information before one, the proper prescription requires all the art one can exhibit.

If hypermetropia is less than 1.00D. under cycloplegia and astigmia is less than 0.25D., glasses are not ordered, provided the accommodation was normal before cycloplegia, and esophoria was not present.

In this connection I must protest against the assumption of Burdon-Cooper that the sole object of using cycloplegics is to make the patient accept more plus. In order to emphasize my objection, I should say that one object of using cycloplegics is to prevent one from prescribing too much plus, and that this is a danger of the binocular fogging method, a mistake of which I have been guilty more than once.

The frequent prescription of o. u. +0.50D. for children may act as a placebo, but it does not have a place in the rational correction of refractive errors. If a child's accommodation is so weak that he appreciates such a lens, he should be forbidden all use of the eyes and sent to his family physician.

Just how much one should allow for the normal tone of the ciliary muscle must be a flexible rule, from 0.50 to 1.00D., depending on the phoria.

Myopia must be corrected for visual and educational purposes, and of itself does not cause eyestrain, but the accompanying astigmia may.

Astigmia. It is in the estimation of the amount and axis of astigmia that the cycloplegic is of most importance. I was one of the early and enthusiastic users of the keratometer[5], and never omit it in a single case, but one should remember that it measures merely the anterior surface of the cornea, and that the other refracting surfaces may modify or neutralize.

There is frequently an astigmia of the lens (whether facultative or not). This is usually against the rule, and is less during cycloplegia. I do not hesitate to increase the cycloplegic finding and occasionally vary the axis. The knowledge of the static refraction enables one to know that his modification is within logical limits.

I have always held as an ideal the objective determination of refraction. An active ciliary muscle introduces an x (unknown) factor into the problem which can be eliminated only by cycloplegia.

A very important reason for cycloplegia in evident eyestrain is the temporary relief of symptoms by enforced

rest of the ciliary muscle. This, for the time being, stops the effort to overcome the refractive error, and enables the patient to accept with better grace the aid of the glasses ordered. Incidentally, the mydriasis of all cycloplegics furnishes an opportunity for examining the peripheral portions of the lens, where incipient cataract is often first manifest, and for a most extensive view of the fundus.

The decision when and how to use drugs is, of course, reserved to the medical profession, as it is often inadvisable and, in an adult, at times dangerous. All reputable ophthalmologists understand these conditions and can be trusted to use proper discretion.

Surgery is the spectacular department of ophthalmology. Being recognized as possessing the necessary courage and dexterity is an experience so satisfying that none can deny its lure; but with most of us, refraction is 90 percent of our work. To be able to restore sight to the blind gives a "grand and glorious feeling", but this is at the evening of life after careers have been run. The correcting of errors of refraction is a service largely to the young, whose careers are before them and are dependent very largely on how perfectly this handicap is removed. Recognition of this difference should make up for the lack of glamour, and inspire one to do his best. And this best cannot be done without a cycloplegic.

Comment. In order to keep strictly to the text, I have omitted a mass of important details which should be included in any adequate consideration of the conduct of a refraction case.

One should take a very careful history to find out the type of patient. In asthenopia it is important to know whether the symptoms follow use of the eyes, or attendance at the theater or at such games as baseball, where one is watching moving objects. Other than ocular causes of headache should be eliminated. Other items are: the occupation, the relation between convergence and accommodation, the fusion faculty, stereopsis, stereoscopic duction, having glasses returned for verification, proper fitting of frames, especially of bifocals, and the pinning of round lenses to prevent their turning[6].

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PATHOLOGY OF THE LACRIMAL GLANDS IN CHRONIC EPIPHORA

M. N. BEIGELMAN, M.D.
LOS ANGELES

The secretory part of the lacrimal apparatus is comparatively neglected in the study of chronic epiphora. The author found marked inflammatory changes in lacrimal glands with no other clinical symptoms than persistent lacrimation. He considers the possibility of a chronic dacryoadenitis secondary to a long standing inflammatory condition of the conjunctiva.

Read before the Eye Section of the Los Angeles County Medical Society, June 6, 1927. From the Eye Service of Prof. M. Levitsky of the University of Kieff.

Persistent lacrimation, which in the absence of any conceivable reflex pathology is attributed to impaired function of the lacrimal apparatus, belongs to the common complaints in our every day practice. In dealing with this problem most if not all of our attention has been concentrated on the excretory part of the lacrimal apparatus. The position of the lacrimal puncta, the permeability of the tear duct, the function of the muscular mechanism are the factors which have been considered, and we have witnessed in the last few years certain achievements along this line, diagnostic as well as therapeutic.

However, the problem of chronic lacrimation, as a whole, remains far from definite solution, and in a large percentage of cases we are still unable to relieve this troublesome condition.

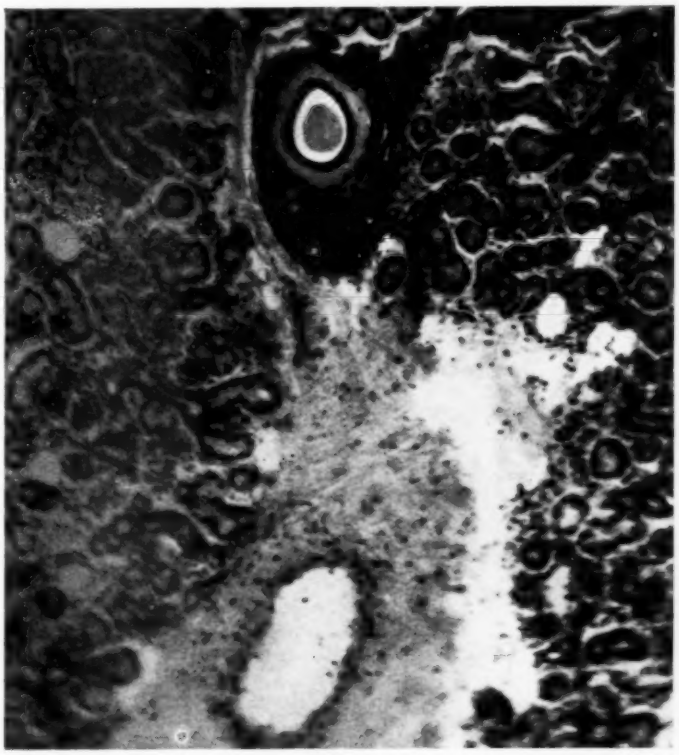

FIG. 1

It seems that some responsibility for the unsatisfactory results in treating chronic epiphora rests upon lack of attention to the secretory part of the

lacrimal apparatus—the lacrimal gland. We can state that outside of rare tumors, fistula, and other curiosities, little is known about the pathology of this gland.

On the other hand, the fact that the lacrimal gland is not immune to certain pathologic conditions of the eye has been shown by recent investigations on trachoma, in which Kreiker[1] (in Germany) and Michail[2] (in France) have proved microscopically the frequent participation of lacrimal glands in the trachomatous process, by the formation of specific follicles, and the subsequent shrinking of glandular tissue.

It is the object of this paper to present certain facts which prove the possibility of a chronic dacryoadenitis without any other clinical symptom than persistent lacrimation. I have examined pathologically six lacrimal glands removed subsequently to the extirpation of lacrimal sacs. The fixation was done in formalin, the staining by Heidenhain hematoxylin, eosin, Weigert-van Gieson, thionin and Unna-Pappenheim methods. Each specimen was examined in a series of sections.

In four glands different degrees of chronic inflammation were found. The infiltration is in a very spectacular manner situated around the excretory ducts, occupying areas of considerable size. (Figs. 1 to 3.) Smaller and more diffuse infiltration is present in the interlobular and interacinous connective tissue. (Fig. 2.) In the sections of one gland the infiltration seemed to be more pronounced in the connective tissue around the gland, penetrating into the substance of the latter along the connective tissue trabeculae. In no specimen could we find any infiltration around the blood vessels.

FIG. 2

As to the character of the cells in the infiltration areas, there is a great predominance of small lymphocytes, some plasma cells and leucocytes can be seen, and in a few sections single red blood

corpuscles and newly formed capillaries are noticeable. The secondary changes consist firstly of sclerosed connective tissue, which, according to the distribution of the infiltration, is to be seen chiefly around the excretory ducts, without, however, compressing them; and secondly of degenerative changes in the epithelial cells near the infiltration areas, due probably to pressure, and varying from paler staining to complete destruction.

chronic dacryoadenitis originated. The distribution of the infiltration, near the excretory ducts and in the connective tissue surrounding the glands, suggests extension of the inflammation by direct continuity from the subconjunctival tissue.

There is an interesting parallelism between the character of the conjunctival inflammation and of that of the lacrimal gland. In trachoma, according to Kreiker and Michail, the changes in

FIG. 3

In interpreting these findings we were aware of the fact that some lymphocytes had been found in normal lacrimal glands, by Axenfeld[3] and later by Thayser[4], and we based our diagnosis of chronic dacryoadenitis on the extent of the infiltration, its cellular character, and the secondary inflammatory changes. The pathological findings in our material give a definite answer to the question of the way in which the

the lacrimal glands are extensive, the lobules being completely destroyed and the excretory ducts greatly compressed by newly formed connective tissue, so that the secretory function of the lacrimal gland may be completely abolished. In simple conjunctivitis, as we have shown, the changes are much milder, the destruction of epithelial cells being limited to the immediate neighborhood of the infiltration, while

the scarring is insignificant and does not affect the lumens of the excretory ducts. As a result the function of the lacrimal gland is not at all diminished. Since the secretion of tears is purely a reflex process, it is to be expected that the physiological stimuli which furnish the basis for uninterrupted function of a normal gland will produce increased response from an inflamed and irritated gland.

In other words, the above-described histopathologic changes in the lacrimal glands explain hyperfunction of these glands in the form of excessive lacrimation.

It is therefore possible that methods —either therapeutic, by roentgen irradiation, according to the technique advised by Hensen and Lorey[5]; or surgical, in the form of deep incisions, cautery puncture, or extirpation of the gland—which tend to diminish or abolish the function of the lacrimal gland will prove to be the only satisfactory remedies in selected cases of chronic epiphora.

727 West Seventh street

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CONGENITAL BILATERAL MICROPHTHALMOS ACCOMPANIED BY OTHER MALFORMATIONS OF THE BODY

ARTHUR M. YUDKIN, M.D.
NEW HAVEN, CONNECTICUT

A child with malformation of the heart, defect of the diaphragm, and supernumerary fingers, died when thirty-five days old. The eyeballs were secured for microscopic examination, and the anomalies found are here described. From the Section of Ophthalmology, Yale University School of Medicine.

Numerous clinical studies have been made on congenital ocular defects, but few have been examined from a histopathological standpoint. The case to be presented offers several points of interest, and differs in part from some of the ocular anomalies previously reported.

J. G., male, two hours old, weighed seven pounds, full term child. Breathing was normal but infant appeared cyanotic. The skull showed very little molding and the sutures and fontanelles were open. The orbital regions presented depressions suggestive of a lack of ocular tissue. The palpebral fissures were considerably shorter than normal, the lid margins were inverted, and the cilia pointed inward. On separation of the lids a slight secretion was noticed. This material was examined and found to be sterile. The lachrymal puncta were well formed and the secretion from the glands appeared normal. The conjunctivas, in the culs-de-sac, were hypertrophied. Separating the lids with retractors, a small eyeball, deep in each socket, showing sclera and cornea was detected. Ocular motility was present. No other malformations of the head were noted.

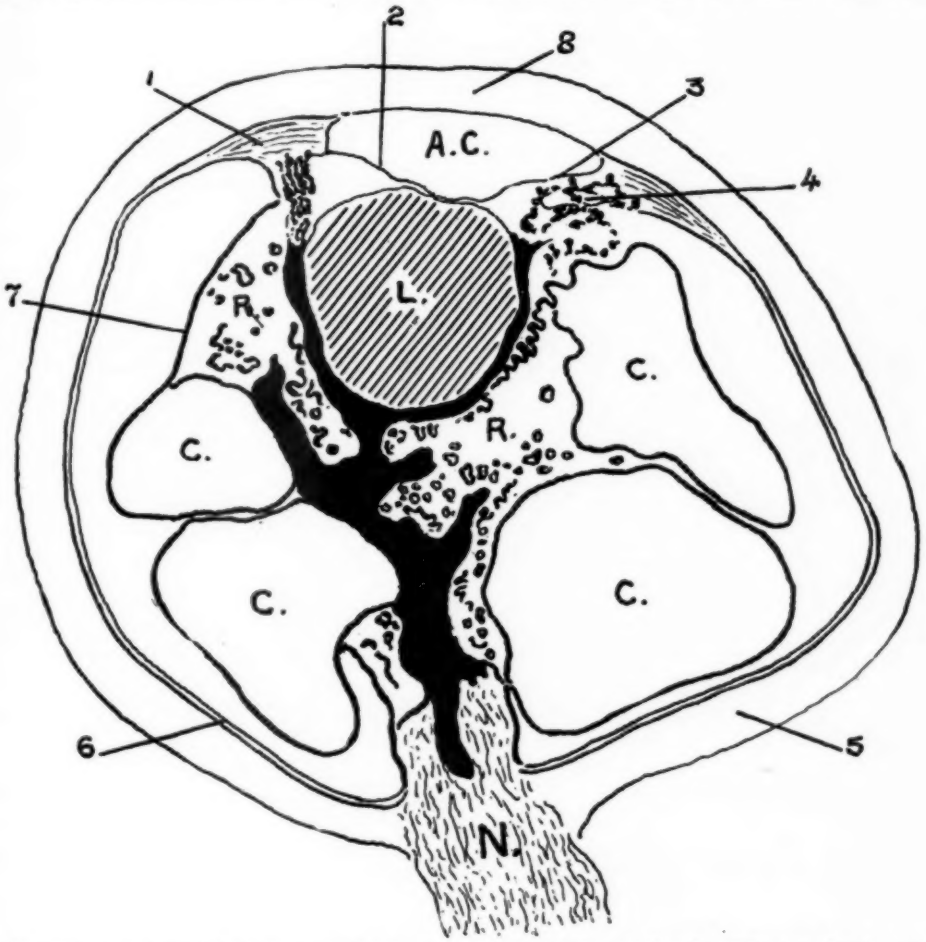
The thorax was well formed and symmetrical and the heart was in the right side of the chest. The abdomen showed nothing abnormal. The left testicle was undescended. There was bilateral talipes calcaneo-valgus. On each hand supernumerary fingers were present; on the left there was a joint with a nail, loosely attached by soft tissue to the second phalanx of the little finger; on the right, the additional finger joined the first phalanx and had two joints and a nail.

X-ray pictures taken on the first day showed no other abnormalities than those described above. The child lived thirty-five days. The necropsy revealed a congenital defect in the diaphragm with herniation of the stomach and spleen into the thoracic cavity. The heart was dextrorotated. A patent

ductus arteriosus and a foramen ovale were found. The intraventricular septum was defective and there was hypertrophy and dilatation of the right ventricle. A double ureter was present on the right and an undescended testicle on the left side. In each orbital socket there was a microphthalmos.

The mother, thirty-eight years old, has borne twelve children, the oldest being sixteen years old. There is no history of any defects in either branch of the family.

Both eyeballs and their adnexa were removed at necropsy. Little difference between the eyeballs was found by external examination, and each measured approximately 9 by 10 mm. The contour was not distorted. The extrinsic muscles were present. No cyst formation nor growth was observed in the orbital socket on either side. The cornea was small, flattened, and hazy. It was impossible to describe the detail of the deeper tissue because of the haziness of the cornea. The optic nerve was normal and extended through the optic foramen to the chiasm. The brain was apparently properly developed and of normal size. A cross section of the



Congenital microphthalmos (Yudkin): 1, ciliary body. 2, pupillary membrane. 3, remnant of iris. 4, ciliary processes. 5, sclera. 6, choroid. 7, detached retina. 8, cornea.

AC=anterior chamber. *L*=lens. *C*=cystic formation surrounded by retinal tissue. *R*=areas of retinal tissues showing Wintersteiner's rosette figures with an invasion of fibroid-vascular tissue represented by dark heavy mass running from nerve to lens. *N*=optic nerve. Single heavy line=detached retina. Heavy central mass=fibrovascular mesoblastic tissue.

eye showed a deep anterior chamber, an obliterated posterior chamber, and a lens dislocated into the vitreous cavity, with a mass of tissue extending from its posterior aspect to the area of the optic nerve.

In the microscopic examination, the lid and the bulbar and palpebral conjunctivas were normal. The cornea and sclera showed no pathological disturbance. The iris was poorly developed, but showed no signs of inflammation. The iris angle was obtuse and the ligamentum pectinatum was distorted so that its structure could not be studied. The venous sinuses in the sclera at the ciliary-iridic junction were poorly developed. A pupillary membrane extended from the remnant of the iris on both sides to the anterior lens capsule, and joined the fibrovascular structure which surrounded the lens. The musculature of the ciliary body was not fully differentiated. The processes were few in number, but extremely large, showing engorged vasculature.

In a serial section of one eye, cyst formation was found between the ciliary processes and the detached retinal tissue. The defective iris and the ciliary processes were agglutinated to the dislocated lens tissue. The circulus major arteriosus was well formed at the ciliary area of the iris. The lens tissue was broken up and no structural detail could be determined. The posterior area was surrounded by a layer of dense fibrous tissue with numerous blood vessels. This band of tissue continued through the vitreous chamber to the disc. The vascular band was flanked on both sides with detached retinal tissue. (Figure 1.)

It seemed as though the optic nerve extended into the vitreous chamber; but serial sections demonstrated the structure as being actually made up of a central layer of fibrovascular tissue, as described above, with the innermost layers of the retinal tissue abutting upon it. The retina was thrown into many folds which almost completely filled the remaining vitreous cavity. The retina, in part, showed normal structure, but in some places there were cystic formations. Where the retinal tissue was folded, as in the central band running through the vitreous and in the convolutions on either side of this structure, numerous retinal rosettes of Wintersteiner were seen. The retina was well supplied with blood vessels.

The choroidal layer was intact throughout the whole specimen. It was thin, however, and no definite vascular structure could be detected in the many slides which were examined. The optic nerve was apparently normal in its structure. The sclera was also normal in appearance and showed the attachment of the external muscles.

Comment: Several explanations have been offered for the occurrence of microphthalmos. There are some who believe that the defect is primarily one of delay or arrest of normal development; others who regard it as produced by an intrauterine inflammation, and some who consider the malformation as a transmissible process with the disturbance in the germ plasm.

Von Szily[1] and Koyanagi[2] have produced evidence of transmission of similar defects in the rabbit. Inspired by their work, I attempted to transmit a microphthalmic and anophthalmic condition which was present in a colony of albino rats to their progeny. The experiment of inbreeding was carried on through the third generation, but no ocular defects were observed in over two hundred animals. The result does not necessarily imply that this type of ocular deformity may not be due to an inherited process. Ophthalmologic records distinctly show that similar congenital defects have been transmitted in man by direct and collateral inheritance. The process is probably produced in the same manner as other inherited malformations.

In favor of the intrauterine inflammatory theory advanced by Deutschmann[3] are the clinical records of several cases of microphthalmos which have been reported in the literature. It is true that this process may explain some of the ocular defects, but it certainly cannot account for the majority of instances. The theory of arrested development is by far the most promising, yet there is no satisfactory explanation of the cause of this

arrest. For many years this hypothesis has been the subject of research by various workers who have introduced chemicals and immunizing serum into the pregnant animal in an effort to produce the defect.

Pagenstecher[4] was able to produce ocular anomalies by feeding pregnant rabbits naphthalin. Kusagawa[5] transmitted to the third generation the defect which he produced by naphthalin in the chick embryo. Guyer and Smith[6] were able to transmit similar ocular abnormalities in the rabbit, in constantly increasing numbers, through eight generations, after injecting lens antigen in the pregnant animal. But Huxley and Carr-Saunders[7], and Poynter and Allen[8], using active, passive and autosensitization, were unable to repeat this achievement. Furthermore, the histological findings of von Szily[1] are similar to those described by Davis[9] from the experimental work of Guyer and Smith. This would suggest that the serologic induction of hereditary modifications in the germ plasm requires further investigation.

There is a definite group of cases on record in which the microphthalmic condition was produced by obstructions such as an orbital meningoencephalocele[10], or malformation of the brain tissue such as hydrocephalus[11]. There is still another group of cases which have been classed as congenital phthisis bulbi.

Summary and Conclusion: The case reported above appears to be that of a simple microphthalmos. It was probably produced by the presence of mesoblastic tissue and persistent embryonic vasculature in the vitreous cavity. The nourishment furnished from this source was beneficial only to the retina, which was prolific in its growth.

This is in accord with von Hippel's contention that the expansion of the globe is dependent on the normal imbibition of fluid by the vitreous. Arguing from the microscopic picture of this eye, the course of further growth of the vitreous was probably altered by the underdevelopment of the ciliary body and its processes, hyperplasia of retinal tissue, and lack of choroidal vascularization. It was probably this arrest of development which was responsible for the presence of microphthalmos. I also surmise from the presence of the Wintersteiner retinal rosettes that they are not pathognomonic of malignancy as is often alleged.

I am indebted to the Department of Pediatrics for the opportunity given me to study this case and to the Department of Pathology for the observations at necropsy.

257 Church street

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SOCIETY PROCEEDINGS

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

December 9, 1927

MR. ERNEST CLARKE presiding

Hyperphoria corrected by operation.

MR. WILLIAMSON-NOBLE showed this patient, a woman aged 24 years, who gave a history of severe headache. Her glasses had several times been changed. She had diplopia on awaking, but during the day she got single vision by tilting her head. Prisms gave some relief, but wearing them was uncomfortable. Vision was 6/4 on both sides. Neurological examination was negative. With red and green glasses the vertical separation of images was increased on looking downward. Mr. Williamson-Noble did recession of left inferior rectus, two mm., under local anaesthesia, and a fortnight later the hyperphoria was reduced to one degree. Headaches had ceased, and unless the patient was lying down and looking over her shoulder there was no diplopia. The operation done in the case was described.

Melanosis of lids and conjunctiva

MR. CYRIL WALKER showed a case of this condition, and asked whether anything was advised, such as removal of a portion of the melanotic region for microscopy, or whether it was considered that this interference would quicken the rate of growth. During the two and a half months the case had been under his observation there had been little change, if any. On the conjunctiva the pigmented area looked like a contact product from the original growth.

Discussion. COLONEL LISTER spoke of a case of his own of similar kind which he had watched eighteen months. Opposite to the point of contact was another growth, then it spread round, and became a definite melanotic sarcoma, and he had to remove all the lids and the eye. He recommended removal of a small piece in this case, and if it was malignant it should be dealt with radically.

MISS IDA MANN showed a similar case affecting the conjunctiva, and which had been known to exist twelve years: the patient's age was now 76 years. It was said to have followed conjunctival ecchymosis. Apparently there had been very little change in the condition over a long period.

Melanoma of lid margin.

MR. MACCALLAN showed a patient from whom he had removed melanoma of the lid margin. He split the outer canthal wall and then removed all the pigment-bearing conjunctiva, also a V-shaped part from the middle of the lid, leaving a two mm. margin of unpigmented skin between the growth and his incision.

Discussion. MR. B. GRAVES thought this was a pigmented mole, as the edges of the tumor did not show signs of malignancy; but a single section was not sufficient for determining whether the growth was malignant

Melanotic sarcoma of ciliary body

MR. ERNEST CLARKE showed a section of this condition, remarking that the patient was brought to him with only a pin-point patch on the limbus. The eye was removed, and death ensued five years later from melanotic sarcoma of the liver.

Slit-lamp.

A number of cases for slit-lamp examination were shown by Mr. C. Goulden and Mr. Harrison Butler.

Relapsed case of interstitial keratitis

MR. HUMPHREY NEAME said the man now shown had had a definite but not severe attack in the left eye in 1926. Within two months the eye became quiet and vision returned to 6/12. In the early part of this year a fairly severe attack of keratitis had occurred in the fellow eye, the right, and that had now become quiet. But about six weeks ago the left eye had had another attack which was very severe, and the patient was suffering from it still.

Symmetrical lens opacities

MR. NEAME also showed an instance of this condition in a boy aged eleven years, the opacities appearing to be of somewhat recent onset. There was a crescent-shaped opacity in the temporal half of the anterior part of each lens.

Bilateral dislocation of lens

MR. M. WHITING showed a brother and sister with this accident; both had small, narrow, pointed heads.

Obstruction of macular artery

MR. F. JULER showed a patient with this condition, the second of the kind he had seen in his experience. Diagnostic points of interest were: opacity of the retina, the sudden onset, and alteration in the caliber of the vessel. He did not know the cause, but this woman was three months pregnant. He thought there might be an embolus produced by cells from the placenta; but he had not met with a case of block of the retinal artery in a pregnant patient before.

Choroiditis juxtapapillaris

MISS IDA MANN showed this condition in a girl aged 13 years, who had a slight swelling at the edge of the disc. There was practically no vitreous opacity, and the condition was subsiding. All tests had been negative. The tonsils and adenoids had been operated upon a year ago, and she had a decayed tooth, but nothing else wrong could be found.

Drusen in a girl

MR. D. CARDELL showed a case of this condition in a girl aged 15 years. He asked whether it was a simple condition, or had a malignant tendency, i.e., inflammation of surrounding structures.

Bilateral tumor of orbit

MR. M. WHITING showed a patient with a swelling in both upper fornices. In the right eye the swelling was large and approached the limbus, and appeared to be fixed to the globe. The tumor seemed to be extending backward. Wassermann was positive, and a small piece removed from the left tumor had the appearance of lymphangioma. If antisyphilitic treatment failed, some other treatment would be tried. Lymphosarcoma was rarely bilateral. A blood examination had not yet been done.

Bilateral macular degeneration

MR. A. C. HUDSON exhibited a girl aged 7 years who until last May had had fairly good sight, but it was now very defective. At school it was noticed that she did not look quite straight in front of her. Nothing in her history seemed to explain the condition. It seemed to be akin to the condition described by Mr. Rayner Batten thirty years ago under the name "symmetrical macular disease". In neither those cases of Mr. Batten's nor in this patient was there any evidence of disease of the central nervous system.

MR. HUDSON also brought a case of this character.

Results of antenatal corneal ulceration

When three weeks old there had been a good deal of discharge from the lids of the right eye, but that had now ceased, otherwise a month later the condition was as now seen. Apparently both corneas had been perforated before birth. Both corneas were extensively vascularized at the periphery. At birth the child had had an ulcerative dermatitis of the neck, and probably the same toxic agent had caused both states.

Spasm of right superior temporal artery

MR. HUMPHREY NEAME showed a case of this condition, which, however, some might label embolism of the artery. A very clean quadrant of the field was absolutely blind. He thought there was still some possibility of recovery of vision.

Retinitis punctata albescens

MR. NEAME also showed a case of this condition. There were streaks and spots of pigment, many upon retinal vessels, as in pigmentary degeneration of the retina. There was contraction of the field in both eyes, and night-blindness, hence in some respects there was a resemblance to retinitis pigmentosa.

Macular degeneration after retinitis circinata.

MR. NEAME further showed a man who in 1923 had had well marked retinitis circinata, and now also had marked angioid streaks in the retina. Pigment proliferation had occurred, but the streaks were the same. Yet vision in the right eye was 6/60, and in the left 6/36.

MR. HEPBURN objected to the term applied to this case, as retinitis circinata was a result of disturbance of the macula. It was an overflow of exudate, some of which organized later.

H. DICKINSON,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY

May 21, 1927

DR. JAMES M. LAMME presiding

Symblepharon from a burn

DR. JAMES J. PATTEE showed H. N., male aged twenty-three years, who had come regarding an injury of his left eye which had occurred on March 12, 1927. Patient was a healthy single American, occupation assayer. He gave the following history:

While working as an assayer at the mines he was pouring some hot slag from a crucible into a mold when some water exploded the hot slag, a particle of which, four by six millimeters, struck him in the left eye. It was two hours before the metal was removed by a physician. The eye was severely burned and the damage grew rapidly worse.

The patient was seen five days after the injury, when the skin over the inner half of the left lower lid was found greatly swollen and deeply burned; the lid margin and lashes were destroyed. The corresponding tarsal and bulbar conjunctivas were likewise destroyed. In spite of treatment, cicatricial union between the raw surfaces developed gradually with corresponding limitation of motion.

Examination May 29, 1927: The lower lashes were destroyed over the inner one-fourth of the lid margin, and the upper lashes were absent for a distance of one centimeter from the inner canthus. There was not pronounced entropion. The inner one-fourth of the lower lid was snugly attached to the globe by the scar. From this point outward there was an attachment of the lid to the cornea embracing the inner lower quadrant, resembling a pseudopterygium but including skin as well as mucous membrane. The upper lid was adherent over the inner two-fifths. The lower inner half of the cornea was practically destroyed by the injury, while the upper external half was quite normal. The lacrimal passages were totally occluded. Movement of the globe was restricted, impairing binocular vision. R.V. = 20/20. L.V. = 20/150.

Discussion. DR. WILLIAM H. CRISP thought that any surgical procedure would be a big undertaking and with very little chance of improving this case because the changes were so extensive.

Traumatic detachment of retina

DR. JAMES J. PATTEE brought T. P., a Spaniard, aged nineteen years, electrician's helper. His health was normal in every respect. He had come on January 31, 1927, regarding an injury to his right eye, which had occurred eleven days previously. He gave the following history:

At 8.30 a.m., January 19, 1927, while hammering on a steel block of a coal cutting machine, something struck him in the right eye at the inner angle. Patient stated that the foreign body nicked skin and margin of upper lid near the inner canthus. Twenty minutes after the injury he visited the mine physician, who found that he could read none of the test type with the right eye; vision left eye, 20/20.

Examination revealed a five millimeter linear vertical cut of the conjunctiva and sclera, situated four millimeters from the limbus at three o'clock. The tension was normal, the pupil small and regular, and the iris slightly muddy. The vision of the right eye was hand movements, poorly. The vision of the left eye was 20/20. X-ray was negative. The magnet provoked no pain. Pupil dilated regularly and fully. Hemorrhage so clouded the fundus that no details could be detected.

The patient was permitted to return to his distant home. Notwithstanding the negative findings, there was some doubt about a foreign body in the eye. The patient returned February 28, and conditions were much as found today. The pupil was small, the iris normal. There was a large detachment of the retina, some old blood deposits and some new retinal vessels.

Vision O.D. hand movements; O.S. 20/20.

Discussion. DR. WILLIAM H. CRISP said that in addition to the extensive retinal detachment there was a proliferation, in a cluster formation, of new-formed vessels which presented a rather different picture from the usual conception of retinitis proliferans.

Melanosarcoma of bulbar conjunctiva

DR. E. R. NEEPER exhibited Charles W., aged thirteen years, first seen May 23, 1927. He was a healthy male; personal and family history negative. When five months old his left conjunctiva had been scratched near the temporal limbus by the sharp end of a small flag stick. No treatment was given. His mother was certain there had been a small, very light brown spot at the point of injury ever since, and that during the past two years the nasal half of the present pigmented area had been formed; also that only during the past year had the conjunctiva around the pigmented patch been inflamed. This inflammation had been observed to increase as the day progressed and might be the result of the blinking of the lids striking the prominence. There was no pain nor photophobia. Vision O.D. = 20/20 − 2; O.S. = 20/40 − 4. Ophthalmoscopic examination was negative.

There was a raised pigmented conjunctival area about two and a half millimeters by four millimeters long axis horizontal, the nasal end of which was flush with the temporal limbus; the greatest depth was about one millimeter. The temporal end was moderately movable with the conjunctiva, while the nasal end was fixed with the conjunctiva at the corneal periphery. A number of rather prominent vessels radiated from the pigmented area.

The case was presented for opinion as to both diagnosis and procedure, since melanosarcoma of the conjunctiva was under consideration.

Discussion. DR. EDWARD JACKSON thought that the appearance and the history of the growth, the fact that the recent more prominent portion of the tumor was increasing in size rapidly, and its location at the limbus, suggested malignancy. He advised that the tumor be excised completely and that if possible a portion of the sclera be included, the removal to be followed by radium and microscopic study of the specimen.

DR. JAMES J. PATTEE had removed a similar growth at the caruncle in a woman 23 years of age, twelve years ago. There had been no recurrence to date.

DR. WILLIAM H. CRISP suggested that even though the history seemed to exclude it there was the possibility of a cystoid degeneration of uveal tissue of traumatic origin. He agreed that the growth should be removed and that one week prior to removal an adequate dose of radium should be given to avoid metastasis.

Complicated black cataract

DR. GUY HOPKINS presented Mrs. B. S., aged 62 years, first seen on May 19, 1927, with the following history: When eight years old she had run a sharp pair of scissors into her right eye, following which she had never been able to distinguish anything but the difference between light and darkness with this eye. Forty years ago she had lost the sight in her left eye, due to a hemorrhage back of the nerve. She had been under treatment at this time for fifteen weeks and had been blind for seven months. Following this, however, she said she had recovered the sight in this eye completely. Ten years ago she had had another attack of the same trouble in this eye, and following this she had never been able to see well with the left eye.

Right eye: The cornea showed a vertical, slightly oval scar three by one millimeter in diameter, located at seven o'clock. Just beneath the lower edge

of the scar was a small hole in the iris, with the iris adherent to the posterior surface of the cornea in the upper margin of the scar. The pupil was two and a half by two millimeters in diameter, was displaced slightly downward and outward, and responded sluggishly to light. Vision in this eye equalled motion of hand at four feet. Pupil dilated slightly on instillation of homatropin. The lens showed a brownish nucleus with a diagonal vertical streak through the right-hand margin, then a clear grayish area, and then a streak of brown. This moved slightly on movement of the head. Light projection and light perception were good in all portions of the field.

Left eye: Pupil two millimeters in diameter, irregular, with posterior synechiae practically throughout the whole margin. The pupil did not dilate with homatropin. Lens showed a small brownish nucleus, shading off into gray to the temporal side. This moved on change of position of the head. Vision equalled 20/240 to 20/120, not improved with glasses. Blood Wassermann was negative.

Discussion. DR. EDWARD JACKSON thought that the right eye offered the better possibilities for operative interference because there was a good response of the pupil to light and therefore probably a good macular region.

Bilateral congenital microcornea with coloboma of iris and choroid

DR. GUY HOPKINS showed Mrs. J. O. D., aged forty years. This patient had first been seen in December, 1923, with a complaint of poor vision. She was the third child of a family of seven, four of whom were living and three dead. She was the only child in her family with poor eyes. No history of any bad eyes in the family previously. Patient had eight children in all, two boys and five girls, living and well, and one boy who died at birth. All of her children had normal eyes.

Examination: O.D.V. = count of fingers at three feet, O.S.V. = 5/120. Right eye turned inward rather markedly and there was marked lateral nystagmus of both eyes. The up and down movements of both eyes were restricted somewhat, but especially of the left eye. Lateral movements seemed to be normal. Right eye was pear-shaped, and displaced downward with a coloboma of the iris in the lower portion and also a coloboma of the choroid which extended up to the optic nerve. Pupil did not respond to light. The lens showed a small central posterior lens opacity. Cornea measured six by five millimeters. Left eye: Pupil was pear-shaped with coloboma of the iris below. There was also a coloboma of the choroid which extended up to the optic nerve. The lens was generally clouded throughout. Coloboma of choroid had been noted before the lens became clouded. Cornea measured six by five millimeters.

Discussion. DR. EDWARD JACKSON believed that it was proper to attempt removal of the left lens, recognizing the difficulty of the procedure, and that a poor prognosis should be given the patient because a coloboma of the choroid had been seen before the cataract formed.

DONALD H. O'ROURKE,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

October 20, 1927

DR. E. A. SHUMWAY, chairman.

Physiology of lacrimal apparatus

DR. EDMUND B. SPAETH briefly discussed this subject, stressing the importance of intact lacrimal canaliculi. The indications and the contraindications for and against a dacryocystorhinostomy were considered in greater detail. A short series of cases was presented to compare the end results with those found following lacrimal cystectomy.

Instruments, technique, and postoperative treatment of the Mosher-Toti dacryocystorhinostomy were presented. A very slight modification for carrying out part of this technique was explained.

The paper closed with the statement that in properly selected cases a dacryocystorhinostomy was a proper surgical

procedure with satisfactory end results in a high percentage of cases.

Lantern slides were used to illustrate the operative fields and end results.

Discussion. DR. LUTHER C. PETER pointed out that in the treatment of chronic dacryocystitis one must be equipped with more than one type of operation in order to meet the contingencies which arise in clinical work. He said that it was perfectly true, as Dr. Spaeth stated, that following excision of the sac there would be some epiphora. In some instances this symptom is not of very great annoyance, and in others it is of considerable inconvenience to the patient. There is a type of dacryocystitis, especially illustrated in the fourth case which Dr. Spaeth presented, in which there was considerable bony obstruction without much inflammatory disturbance; and for this type the Mosher-Toti operation is better adapted than that of excision.

The technique of the operation is not difficult, and one is not obliged to work with the same meticulous care as is required in excision. In Dr. Peter's experience the success of the operation depends upon three points in the technique. In the first place, it is essential that the bony window be made sufficiently large to prevent occlusion after recovery. The second important point in the technique is the preservation of the external wall of the sac and the canaliculi. This is easily accomplished by care in pressing the sac toward the eyeball while the bone is being denuded of its periosteum. A third point is that of stitching the anterior sac wall and fascia to the periosteum on the nasal side of the wound. When cases are of long standing, and the pyogenic process is therefore marked, excision of the sac is still the operation of choice.

DR. WM. ZENTMAYER said that he had had no experience with this type of operation, as he had been well satisfied on the whole with the results obtained by removal of the sac.

Two cases of reticular degeneration of the cornea

DR. WM. ZENTMAYER stated that both cases were seen at the Wills Hospital. The case presented was in a married woman 44 years of age, with six healthy children none of whom had eye trouble. Her parents were living. The father probably had corneal dystrophy in one eye. Two members of the family had pterygium. The patient had had recurring attacks of inflammation in the eyes in childhood. On August 2, 1927, the eyes again became irritated, and two weeks later she was admitted to the hospital with superficial corneal ulcers of the left eye.

In the right eye the bulbar conjunctiva was relaxed and inelastic, a narrow fold being pushed up over the lower limbus corneae by the lower lid. There was no bulbar injection. The corneal sensibility was diminished. The surface was uneven, but the epithelium was intact. By oblique illumination there was diffuse haziness throughout, made up of minute greyish lines. By transmitted light these appeared as branching lines, forming a network.

Biomicroscopic examination showed innumerable greyish opacities which, for the most part, were in the superficial layers of the cornea, but some also extended into the middle layers. The opacities were in the form of irregularly curved and straight jagged lines of varying diameter, some isolated but mostly branching, with dot-like opacities at their intersections. Where these opacities crossed the anterior surface of the corneal parallelopiped, the surface was bulged forward.

Some of the lines could be seen to run from the region of Bowman's membrane obliquely into the middle layers of the stroma. There were two small nebulae on the temporal side next to the limbus. On the nasal side at about three o'clock there was a superficial opacity running out from the cornea several millimeters, which was covered with superficial vessels from the conjunctival loops. There were no deep vessels in the cornea. The anterior chamber was of normal depth. The iris was brown, markings distinct. The pupil measured three millimeters and reacted normally. The lens and fundus seen through the corneal haze seemed normal.

The vision in the right eye was 6/12, and in the left 5/60. The tension in both eyes was normal.

In the left eye the cornea showed a similar, but more advanced condition than that seen in the right eye. There were, in addition, two superficial, centrally placed ulcers about two millimeters in diameter which stained with fluorescein.

The physical examination showed: Kahn test negative; Von Pirquet negative; urine, specific gravity 1028; albumin and sugar negative, reaction acid. The nose and throat showed hyperplastic ethmoiditis and a chronic infection on the left side (operation Oct. 6, 1927). The tonsils were buried and showed moderate infection. There were several infected teeth.

The second case, which had been too recently seen for careful study, was in a man about 65 years of age. The left eye had been lost from an injury fifteen years ago. The right eye presented precisely the condition noted in the first case. The surface of the cornea was, however, more uneven, and near the limbus below there was a triangular deposit about two by three millimeters, grayish in color, probably hyaline material. There was complete anesthesia of the cornea.

The description as given is from the house notes taken by Dr. Muldoon of the resident staff of the Wills hospital.

A case of posterior lenticonus

DR. WM. ZENTMAYER stated that this anomaly was seen in the right eye of a girl sixteen years of age, with typical pigmentary degeneration of the retina.

By transmitted light, with a +15. D. sphere, the lenticonus had an apparent size of about 4.5 mm., was situated at the posterior pole of the lens, and had the characteristic appearance of a drop of oil. When the light was played about it, several very small beadlike elevations were seen near its base. These were noted with the ophthalmoscope.

The biomicroscopic study was made by Dr. Cowan, who recently reported on a similar case of Dr. Reese. The two cases will be reported in full by Dr. Cowan and Dr. Reese.

Use of photographic enlargements for illustrating fundus details

DR. ALFRED COWAN exhibited several fundus drawings to show the usefulness of photographic enlargements for illustrating fundus conditions. The originals were made with the Nordenson-Zeiss camera and were enlarged about four times on semimatte paper. One with very little talent for drawing is in this way enabled to make well proportioned illustrations of fundus conditions. The black lines are done with a carbon retouching pencil, and the high lights are scratched with a knife. Colored pencils may be used if desired.

It was found that two enlargements from the same original, when properly mounted, give a very good stereoscopic effect. Gratitude was expressed to Mr. MacMillan, of Street, Linder, and Propert, for his help in preparing the photographs.

LEIGHTON F. APPLEMAN,
Clerk.

BALTIMORE MEDICAL SOCIETY

Section of Ophthalmology

October 27, 1927

DR. JONAS FRIEDENWALD presiding

Posterior sclerotomy for glaucoma

DR. HARRY FRIEDENWALD read the paper on this subject which is published on page 107 of this journal.

Retroconjunctival posterior sclerotomy

DR. JONAS S. FRIEDENWALD reported a case in which the operation described on page 111 of this journal was successfully performed. The patient was a man of 75 years who had had a stroke, with facial paralysis and lagophthalmos. A malignant corneal ulcer covering two-thirds of the cornea developed and was complicated by a very severe acute glaucoma. When first seen, four weeks after the apoplexy, the condition looked quite hopeless and the usual modes of treatment, including cautery, eserin and local antiseptics, were unavailing. Posterior sclerotomy was performed through the lower lid, avoiding the conjunctiva. This resulted in a satisfactory lowering of tension, follow-

ing which the corneal ulcer healed without further complication.

Discussion. DR. ALAN C. WOODS said that posterior sclerotomy appeared to him to have a definite place in acute glaucoma as a primary operation before iridectomy or trephining. It had given a transient drop in the intraocular tension which allowed more permanent fistulizing operations to be done with greater safety. He had, however, never seen any permanent drop in the intraocular tension result.

DR. C. A. CLAPP said if it is true, as some claimed, that acute glaucoma was due to swelling of the vitreous, then a posterior sclerotomy with relief of tension in the posterior part of the eye would be the operation of choice and Dr. Friedenwald's case would rather substantiate this claim, but he was not quite ready to accept it without any further scientific proof. Clinically he had not been so happy in his results as Dr. Friedenwald.

As to the second paper he would criticize the name "transpalpebral sclerotomy" for this operation. It seemed to him that post- or retroconjunctival posterior sclerotomy would be much more descriptive and less liable to confusion. He thought it a procedure that might, under the conditions described by Dr. Friedenwald, be of very great value although he had never been confronted by such a case.

DR. HIRAM WOOD said that he was intensely interested in the results which Dr. Harry Friedenwald has obtained from posterior sclerotomy; that they were the most striking he had ever heard from an operation which he believed had been generally discarded. So far as Dr. Wood's own experience was concerned, he has done the operation only when, in chronic glaucoma, iridectomy had failed to reduce the tension permanently. Even this was years ago and he gave up doing it because it seemed to him that no permanent result was obtained; plus tension returned and the nerves went on to atrophy.

DR. L. J. GOLDBACH said that the operator, his technique, and the status of the patient at the time of operation definitely decided the actual outcome of any operation. He judged that was why some surgeons praised and others condemned the various operations for intraocular tension. Dr. Friedenwald's paper gives a good deal for thought, and while many have abandoned posterior sclerotomy, he feels at least that we are justified in giving it serious consideration when such an eye as described presents itself for operation.

L. J. GOLDBACH,
Secretary.

BALTIMORE MEDICAL SOCIETY

Section of Ophthalmology

December 1, 1927

DR. JONAS FRIEDENWALD presiding

Result of fistulizing operations in glaucoma

DR. W. H. WILMER (by request) gave a brief report of the discussion on this subject at the meeting of the Oxford Ophthalmological Society in July.

He showed slides illustrating in animals the various kinds of scars from the anterior sclerectomy of Lagrange, the sclerocorneal trephining of Elliot, iridotasis, wedge isolation, small flap sclerotomy, and the iridencleisis of Herbert; and colored drawings of slit-lamp examination of filtering scars in humans. He described his method of using a free graft of Tenon's capsule to strengthen the conjunctival covering of the trephine opening and exhibited a patient on whom this operation had been performed ten months ago.

Discussion. DR. J. FRIEDENWALD had had an opportunity of examining microscopically in the past four years eleven eyes that had been enucleated after failure of the trephine operation. The causes of failure were as follows:

Late infection	3 cases
Massive intraocular hemorrhage	2 cases
Anterior subluxation of lens with hernia of lens in trephine hole	2 cases
Injury of lens at operation with traumatic cataract and lens cortex in trephine hole	1 case
Prolapse of iris or ciliary body in trephine hole	3 cases

Therapeutic use of tuberculin in ocular tuberculosis

DR. A. C. WOODS reported forty-two

patients with ocular tuberculosis treated with tuberculin. All patients were markedly hypersensitive to tuberculin given intracutaneously.

Forty-five percent of the patients thus treated appear healed, 45 percent show definite improvement, and 10 percent were unimproved. The healing is slow, and the greater number of patients classed as "healed" are those treated over several years. About 25 percent of the patients treated showed recurrence of the local disease. Improvement usually begins early in the tuberculin treatment. These observations indicate tuberculin to be of real value in the treatment of ocular tuberculosis.

Discussion. DR. W. H. WILMER said the Society was very much indebted to Dr. Woods for the very concise way in which he had placed before them the present status of tuberculin therapy. He thought it was particularly important, because there was such a divergence of opinion. Some use one-half mg. of tuberculin for a diagnostic test, and others fear to use even the smallest amount or are disinclined to use it in any way.

In cases of tuberculosis of the anterior portion of the globe, in addition to tuberculin, other remedial agents have seemed to exert a beneficial influence, such as hot applications, dionin, and the very careful use of violet radiation. In diseases of the posterior portion of the globe, radiation has had no beneficial effect in Dr. Wilmer's experience.

DR. CLAPP: Of course, the members of this Society are aware that I have been a great advocate of the use of tuberculin in eye lesions and was the first in the city of Baltimore to make use of it therapeutically.

At a recent meeting of the American Ophthalmological Society, Dr. Verhoeff stated that 100 percent of the anterior nodular scleritis cases were due to tuberculosis, but such view was not held by all members of the Society, and, while Dr. Woods' cases seemed to improve rapidly under tuberculin therapy, I do not think this proves that they were tuberculous in nature, as a recent experience with such a case shows. nodular scleritis, was surveyed as completely as possible with negative results, with the exception of the tuberculin sensitivity test, and while I was trying to get this test made, the eye lesion cleared up with practically no therapeutic measures. If this patient had been getting tuberculin therapy the improvement would have been attributed to the tuberculin.

It is extremely difficult to be certain that a case is tuberculous and I only feel certain in my own cases when I get repeated focal reactions at the borderline dose, and these doses just near the borderline seem to be the most effectual therapeutically.

DR. ROBINSON asked if potassium iodide was contraindicated in ocular tuberculosis, as for instance in cases of vitreous opacities associated with tuberculous choroiditis. This drug has always been considered as an absorbent and its use for vitreous opacities may be counterbalanced by its possible harmful effects on latent tuberculous infection in the lungs.

DR. WOODS replied that it could be used ad libitum since it did neither good nor harm.

DR. KNOOR said he thought that Almroth Wright, in his Herter lecture in 1905, had shown that the opsonic index, which was an index of the patient's immunity, fluctuated and that the immediate result of an injection of tuberculin was to lower the opsonic index. This reduction was usually of a few hours duration but might be of several days duration. It seemed possible that without a laboratory guide one might give the injections at the wrong time and thus keep the patient's immunity continually low.

L. J. GOLDBACH,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

November, 1927

DR. J. LESLIE BRYAN presiding

Congenital bilateral corneal opacities and displacement of pupils

DR. HILLIARD WOOD reported the above case in a baby two weeks old. The

day after birth it was noticed that the lower and outer portion of each cornea was white, more so on the left side.

Examination showed bilateral symmetrical corneal opacities somewhat V-shaped extending in the right eye from 7 to 10 o'clock and reaching to the center of the cornea; extending in the left eye from 2 to 5 o'clock and reaching to the center of the cornea. The corneas were not ulcerated nor inflamed, there was no pericorneal injection, redness, or other evidence of infection or inflammation. Each pupil was displaced downward and outward about two millimeters. There was no evidence of other congenital defects in the patient nor was there a history of congenital defects in the three brothers and sisters, or other relatives. It was impossible to tell whether the iris responded to light, as the baby was so young.

Choked disc following ligation of internal jugular vein in lateral sinus thrombosis

DR. W. G. KENNON reported the following case: F. M., white, male, 47 years of age, gave a history of pain in the right ear of fifteen days' duration. He had the clinical and roentgen ray findings of acute mastoiditis. A myringotomy of the right ear was done, which resulted in a profuse purulent discharge. There was no evidence of intracranial involvement at this time. A simple mastoid operation was done three days after the patient was first seen. The mastoid cells were of the pneumatic type, and were filled with thick yellow pus. Three quarters of an inch of the lateral sinus was exposed. As it was normal in appearance, it was not incised. A culture taken from the mastoid at the time of the operation was positive for hemolytic streptococci. The postoperative course was very satisfactory until the fifth day, when the patient began to have chills and a temperature between 102° and 104°F. A blood culture showed only one colony of the hemolytic streptococci, but another culture on the following day showed 433 colonies of hemolytic streptococci per c. c. of blood. The right jugular vein was ligated, and the lateral sinus was exposed and incised. The jugular was normal in appearance, the lateral sinus was thrombotic, but not occluded. Two days later the blood culture was negative, the temperature reached normal, and it has practically remained normal since then. The patient had a quick convalescence until five weeks later, when he began to have rapid loss of vision. Ophthalmoscopic examination revealed a choking of three diopters of the left disc and a distinct blurring of the right disc. The eyegrounds had been negative on all previous examinations. The vision was 20/200 in both eyes, and the visual fields were constricted, the left being more pronounced than the right.

The neurologic examination was negative, except for choked discs. Spinal puncture showed a pressure of 330 mm. After repeated spinal drainage and intravenous hypertonic glucose administration, the spinal pressure fell to 210 mm., but the choking and poor vision did not improve.

The question of a cerebellar abscess arose because of the increased intracranial pressure, vertigo, and no labyrinth response on the right to the caloric test. Three months after ligation of the jugular vein, a cerebellar exploratory craniotomy was done. The right cerebellar lobe was explored with a cannula, no pus was found, but in front of the cerebellum an enormous cavity filled with cerebrospinal fluid was entered. About fifty c. c. fluid was withdrawn, which relieved pressure on the cerebellum. A diagnosis of basal arachnoiditis was made.

In about one week from date of craniotomy his vision began to improve, the choking of the discs was less marked, and in one month he had vision of 20/20 in both eyes, and practically all evidence of choking was absent. The patient is now free of all symptoms of intracranial pressure and his vision is still normal.

Discussion. DR. KENNON said, in conclusion, he did not believe that in making a diagnosis of lateral sinus thrombosis we were justified in waiting for a positive blood culture, as we were endangering the life of the patient when we allowed our natural timidity to

prevent us from doing the thing that we knew we should do. He had had three patients with lateral sinus thrombosis in the last six months, all of whom were living. Only about fifty percent of cultures are positive, for if there is a complete thrombosis there will probably be a negative culture. A positive blood culture is either an early or late sign. If we delay we get a positive blood stream infection, and the purpose of the operation is to prevent blood stream infection. Dr. Kennon's results with ligation in eight or ten cases have been extremely good. The last one had a rather stormy convalescence.

R. J. WARNER,
Secretary.

PUGET SOUND ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

November 15, 1927

DR. H. V. WÜRDEMANN, president.

Amblyopia

DR. W. D. CAMERON presented D. M., female aged ten years. Her mother had had several spontaneous fractures of the long bones, loss of knee jerk, Argyll Robertson pupil, Wassermann four plus, and had been under specific treatment for ten years. Father was in good health but was rather neurotic. He had had no blood examination. One sister aged twelve years was in good health. Mother stated that D. M. had been underweight and not very strong, that for the past six months her eyes had pained after reading, that she had blurred vision and black spots before the eyes and that these symptoms were gradually growing worse.

Examination: O.D. V.=6/30, O.S. V.=6/30. Pupils were equal and reacted to light and accommodation. Corneas were negative. O.D. showed large floating opacities in the vitreous, disc round and fundus negative; O.S. remains of pupillary membrane in lower part of pupil, media clear, disc round, fundus negative.

Refraction: O.D. +0.50 sph +0.75 cyl. ax. 120°, V.=6/12; O.S. +0.50 sph.+0.75 cyl. ax. 75°, V.=6/15. With refraction the same in each eye, the better vision should be in the left eye where there were no floating opacities.

The fundi appearing normal, the disease was thought to be in the optic nerves or tracts. Specific treatment had been started.

Chronic retinitis with vitreous hemorrhages

DR. A. E. HILLIS presented Mrs. A. O., who at the age of six years, had had a growth removed from the right eye. Following the operation the eye had to be covered for several months. Ten years ago was treated by an oculist for rheumatism (?) in the eyes for two weeks. Four years ago was treated for sore eyes for one week. Three weeks ago she suddenly noticed a spider-like spot in the right field of the right eye, which gradually grew less until there remained only a web. She consulted Dr. Hillis on Nov. 1, 1927, complaining of poor vision and the web in the right eye. Vision O.D. = 20/200; O.S. = 20/80; corrected by suitable lenses to O.D. 20/30, O.S. 20/40.

The conjunctiva was normal in both eyes, the right cornea showed a large V-shaped opacity below, with apex up, extending to pupillary margin. The left cornea was clear, pupils and lenses normal. In the right vitreous was a large floating opacity below the disc. It was round, with a hemorrhage or small aneurism in the center. Vessels in the fundus were small, sclerotic, with exudative, irregular deposits to the nasal side of the disc and scattered along and above and below the nasal vessels. The left vitreous was clear, disc normal, vessels small and sclerotic with small spots of exudate along nasal vessels.

Blood pressure was 90/155. No increase of ocular tension was present. The right field was contracted.

Five percent dionin was used locally and potassium iodide internally.

Discussion. DR. W. F. HOFFMAN said that the case impressed him as representing some type of retinal degeneration. The deposits in the upper nasal quadrant showed some profound retinal change, and the cupping of the nerve seemed more that of atrophy than that secondary to tension.

Chronic uveitis

DR. J. S. DAVIES presented Mrs. A. R. D., aged forty years. Family history was negative. She had several living, healthy children. She had always been more or less troubled with her eyes, and had worn glasses at twelve years of age, for two years, Twelve years ago she had had her first attack of iritis, since which time she had had several. She had been deaf following influenza in 1918 (middle ear deafness). For the past five years,when attacks of iritis had started, she had used dionin and had been able to hold the attacks down. Present attack started one week ago. She had had much pain in the right eye and right side of head.

Vision was 20/200 each eye. Lids seemed thickened. There was a small amount of mixed infection in the right eye. Both pupils were small, irregular, and bound down by posterior synechiae. Pupils dilated slowly and irregularly with powdered atropin and heat. After dilatation it was impossible to see the fundi on account of the pigment on the anterior surface of the lens. There were some changes in the lens. In the left lens there was a posterior polar cataract. Wassermann was negative. Patient had been under antiluetic treatment for some time.

Discussion. DR. W. F. HOFFMANN suggested the use of small subconjunctival injections of atropin rather than powdered atropin, as the local effect was better and there was no more and possibly less danger of constitutional effects. Many men advocate and have good results from iridectomies in these cases. In this case, on account of the polar cataract, an iridectomy would have double advantage, its therapeutic effect and a clear area of lens.

Traumatic ophthalmoplegia externa

DR. D. H. BELL presented Mr. M. C., longshoreman, who had been struck across the right brow and antrum with a black jack on Aug. 14, 1927. Deep hemorrhages into the orbit with proptosis of the eyeball, great edema of conjunctiva and of lower lid with eversion of lid were present. Paralysis of ciliary muscle and superior and inferior recti and of the levator palpebrae existed. On November 15, this paralysis still existed but exophthalmos and edema had disappeared. The upper lid completely covered the eye at all times. Superior and inferior recti muscles had partially recovered their tone.

Retained foreign body in lens with traumatic cataract

DR. D. H. BELL presented M. A. G., who had been struck on the right eye Sept. 25, 1927, supposedly by a chip of cement, while hammering with a steel hammer on a chisel. The patient was seen by a general physician and after two weeks was referred because of infection of cut in cornea. As this healed a cataract developed and x-ray showed an intraocular foreign body. A magnet was applied and the foreign body appeared at the anterior surface of the lens. Foreign body was then left for ripening of the cataract and until adjustment with the insurance company had been made. The eye was not painful or inflamed. Steel showed in the lens. The question was of the condition of the cataract and indication for operation.

Uveitis with opacities of vitreous

DR. JOHN ARNASON JOHNSON presented C. G., male aged twenty years. He had had the usual diseases of childhood. He first noticed his left eye blurred while attending a baseball game in July, 1927. Examination September 23 showed pupils reacting to light slowly; left vitreous cloudy; one crowned tooth; tonsils submerged, septic. X-ray plate of teeth was negative; Wassermann negative. Vision O.D = 20/20; O.S. = 20/50.

Treatment was tonsillectomy. Patient was also given solution of potassium iodide and rest. Examination November 15 showed that the vitreous had cleared up very much, there being no dark specks. Vision O.D. = 20/20; O.S. = 20/30, improved by glasses to 20/24.

MORRILL J. MORRIS,
Secretary.

THE PITTSBURGH OPHTHALMOLOGICAL SOCIETY

November 28, 1927

Dr. E. B. Heckel presiding

Sarcoma of the choroid

Dr. W. E. Carson reported the case of a 47 year old minister who was first seen Sept. 22, 1927. He complained of failing vision in the right eye which was first noticed six weeks previously.

The vision with correction for a slight degree of astigmatism was O D 6/30 partly, O S 6/5.

The form field of the left eye was normal, that of the right eye showed loss of vision in practically the entire upper half and nasal quadrant, vision being retained in the lower temporal quadrant of the field, including a small area around the central fixation spot.

With the ophthalmoscope, and also by focal illumination, there was to be seen a mass projecting into the vitreous, situated just behind the lens and occupying an area extending from 6 to 10 o'clock. The summit of this mass appeared of slightly lobulated shape. The color was a reddish dusty white or grey. Some fine small blood vessels could be seen traversing the surface. There was a small angular area suggesting pigment, but no evidence of excessive pigmentation to be seen. Beyond this mass, the retina appeared dull and lusterless, suggesting a slight degree of detachment, as far back or somewhat further back than the equator.

There was no pericorneal injection, no discoloration or external deformity. Both irides appeared of the same color and with the slit lamp there was no enlargement of the blood vessels of the iris anterior to the involved area, such as has been reported in some cases of tumors situated in the anterior segment of the ball.

Tension, both eyes, 15.5 mm. (Schiötz). Transillumination, luminosity somewhat reduced.

The eye was enucleated Oct. 11, 1927. Dr. John S. Plumer's report on the specimen was in part as follows:

"On section through the globe, a small mushroom-shaped nodule of new growth is seen arising from the lower temporal quadrant of the eyeball over an area somewhat anterior to the equator. The cut surface measures about 8 mm. in length by 5.5 mm. (fixed specimen). It is greyish white.

. . . . . .

"The choroid has been destroyed and replaced by tumor cells at a point slightly anterior to the equator. . . . . The neoplasm itself is quite cellular, there being scarcely any supporting stroma visible. These cells are spindle shaped with elongated neoplasmic processes and with elongated or elliptical shaped nuclei. What appear to be mitoses are present in places. Scattered sparsely through the section are a few irregular or polygonal shaped cells containing coarse dark brown pigment which on special staining gives no iron reaction, indicating that the pigment belongs in all probability to the melanin group. A prominent feature is the presence of numerous large thin walled vessels distributed throughout section of the tumor mass. The cells tend to be arranged in interlacing whorls, some of which appear in cross section.

"There is no evidence from the section examined of invasion of the sclera or optic nerve, the neoplasm apparently being definitely circumscribed and entirely intraocular.

Diagnosis: sarcoma of the choroid (probably melanotic)."

Dr. Carson reviewed the subject of sarcoma of the choroid. The shape of the tumor in this case was typically of the mushroom type. If an eye with sarcoma of the uveal tract is enucleated before there are visible signs of extension (as in the case reported) the chances of local return are slight; but the prognosis as regards metastasis is still grave. The average of the published statistical tables shows a fatal result in about thirty percent of all cases. Metastases may follow even an early enucleation. Such metastases may remain quiet at first and sometimes only after years, according to Fuchs and others, cause death, although some authorities consider these apparent very late metastases as distinct new growths.

Discussion. Dr. Edward Stieren referred to a case report of sarcoma

of the choroid in which enucleation had been refused until the tumor had extended into the orbit. Followng enucleation radium needles were inserted. There had been no recurrence in seven years.

DR. EDWARD B. HECKEL said the most important thing was to make an early diagnosis. The neoplasm never perforates the retina, but just shoves it forward. Transillumination is a very important method of study. After a diagnosis of tumor has been made, the question of malignancy is also practically settled, as intraocular tumors are usually malignant. With regard to metastasis, Dr. Heckel leans to the belief that what are usually referred to as metastases are more like multiple foci. He thinks radium should only be used in cases in which there has been extension into the orbit. Dr. C. L. Reed referred to the fact that radium sometimes creates a periostitis of the orbital wall.

Unilateral synchysis scintillans in a child: cure

DR. EDWARD STIEREN, in reporting such a case, remarked that none of the authorities consulted mentioned the possibility of this condition occurring in childhood. According to Fuchs, the crystals are sometimes found in eyes that are otherwise healthy (especially in elderly people).

Collins and Mayou state that primary degeneration of the vitreous causes its fibrous network to become destroyed, so that it acquires a fluid instead of a jelly-like consistence. In this fluid, fragments of the network float about on movements of the eye. A fatty change may sometimes take place in the fibrils, resulting in deposition of crystals of cholesterin. A similar quotation from de Schweinitz was also read. The appearance of synchysis scintillans in one eye of a child is unique and complete disappearance of the cholesterin crystals upon systemic treatment is remarkable.

Case: B. W., a male child, six years of age, was first seen Dec. 11, 1926. Externally the eyes were apparently healthy in all respects, pupils normal in size and reaction. Under atropin, retinoscopy, on December 13, showed the refraction to be −5.00 D. in each eye, giving V. O.D. 6/20, O.S. 6/15 (illiterate). With the ophthalmoscope the right vitreous was literally filled with brightly refracting cholesterin crystals, the appearance at a half meter with a strong light in the ophthalmoscope resembling a miniature snow storm. The left vitreous was clear but both fundi were cloudy so that no distinct outlines could be seen.

The mother stated that the child had been quite jaundiced when born. This persisted for a long while during infancy, and the patient was always subject to attacks of jaundice, vomiting, and headaches. He was small for his age and underweight.

As to his systemic condition he was referred to Dr. W. W. Lermann, who reported a definite hepatitis and slight liver enlargement with a very spastic duodenal cap, suggestive of some gall bladder infection during infancy. Wassermann was negative. A later report from Dr. Lermann stated that the boy had been put on a diet to overcome the putrefaction present in the intestinal tract (low meat intake, mixed glands No. 1 and one Allisatin tablet once a day as his intestinal tract improved). The liver lessened in size and the patient gained weight. When seen in September he had had no attacks of headache and no return of nausea.

The eyes were examined periodically during the year and there was gradual disappearance of the crystals in the right eye. At the same time the fundi became clearer. At the last visit, complete search of each fundus failed to reveal any pathologic lesions, the right vitreous was as clear as the left, and vision has improved to 6/8 (illiterate) in each eye.

Discussion. DR. ADOLPH KREBS remarked on the unusualness of such a case and asked if the movement of the particles had been very rapid, indicating marked fluidity of the vitreous, and whether there had been any opacities on the posterior capsule of the lens.

DR. GEORGE H. SHUMAN spoke of the advantage of slit-lamp microscopy in differentiating types of opacities in

the vitreous. Slit-lamp observers, including Koeppe, Vogt, Gallemaerts, Kleefeld, Koby, and Butler, have all reported that in the cases of synchysis scintillans which they have examined the opacities have not been crystals at all, but shiny whitish globules, discs, and amorphous points of different size. The actual crystals, rhomboidal and triangular in shape, showing a reddish and greenish iridescence, which slit-lamp examination frequently reveals in the lens, iris, and cornea in certain pathologic conditions, notably long continued inflammatory processes, have apparently never been observed in the vitreous in cases of so-called synchysis scintillans. While these crystals were referred to in slit-lamp literature as cholesterin, the speaker was under the impression that their true chemical nature had not been positively established. Koeppe teaches that the particles which are seen in the vitreous in synchysis scintillans are amorphous fat bodies composed of margarine, palmitine, stearine and soaps. He believes that leucine occurs only in the dead eye because leucine needles have never been seen with the slit-lamp in a living eye; also that true cholesterin is a post-mortem product. It is apparent from these observations that an ophthalmoscopic diagnosis of cholesterin crystals in the vitreous may be misleading.

In closing, DR. STIEREN answered Dr. Krebs that there apparently had not been any great mobility of the vitreous opacities in his case and that no particles had been localized as on the posterior lens capsule. He was inclined to accept the chemical and physical properties of the particles seen in classical synchysis scintillans as stated by the authorities quoted in his case report.

GEORGE H. SHUMAN,
Secretary.

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RELATION OF OPHTHALMOLOGY TO BLINDNESS

From the time, 1500 B.C. when we know that trachoma, in Egypt, was treated with caustics and astringents, down to the latest modification of extraction in the capsule for cataract, the striking developments of the art of ophthalmology have been mostly by efforts to remove or prevent blindness. This struggle against blindness has not only led to operations, like the opening of abscess with a bronze lancet in Babylonia five thousand years ago; or the couching of cataract in India; or the practice of iridectomy for closed pupil, or to check glaucoma, in Europe; or the plastic operations for entropion; or the transplantation of the cornea.

It stimulated the invention and use of the ophthalmoscope, to study the causes of blindness and discriminate between its different forms, with their correspondingly different treatments. "Color blindness" aroused interest in the physiology of color perception. Amblyopia ex anopsia turned attention to the correction of squint. Myopia and presbyopia brought the use of lenses to relieve the disability of impaired vision, and to prevent the detachment of the retina, or the cataract, which was liable to follow the unchecked progress of the refractive change. Blindness from disease of the visual tracts and centers drew attention to disease of the hypophysis, to cerebral physiology, to localization of function and to central disease in general.

The combat with blindness was the origin and development of ophthalmology, from its prehistoric beginnings to its most recent achievements; and it is still going on to new triumphs, new claims to confidence, respect, and gratitude for those who continue to carry it forward. To regard every failure of treatment as an opportunity and a challenge for a new advance is to utilize the ever present reminders of the limitations of our efforts, and the incompleteness of our art, and is to turn these occasions for chagrin and discouragement into achievements of general benefit and honor. These opportunities do not all come to the specialist or the operator. Blindness was greatly decreased, one hundred years ago, when vaccination limited smallpox; and when, within the present generation, focal infections began to be sought and eradicated, the chain of obscure cause and malignant result was again broken.

It is from ophthalmologists, who are constantly testing vision and watching the course of ocular lesions, that most is expected in the future prevention and gradual elimination of blindness.

The number of the blind increases continuously from infancy to old age, through preventable infections, avoidable injuries or ocular lesions incompletely cured; or through defects of refraction or ocular movement, not fully or early enough corrected to forestall the changes that go on throughout life. Blindness in old age is often the cumulative effect of damages to vision from the untreated or ineffectually treated injuries and diseases of a lifetime.

There is still great need to extend and perfect all methods of rational ophthalmic treatment. There is need for constant watchfulness that the cure in each case shall be as perfect as possible; that every advance in our art shall be known to each of us engaged in ophthalmic practice, and be mastered for effective application in the next appropriate case that presents itself. There is even greater need that the broad education of the public be carried on, as to the possible dangers that will bring blindness to many if not guarded against, and as to the resources of modern ophthalmology, improved conditions of labor, limitation of epidemic diseases, and earlier perception of danger. These resources can only be made available when every one in the community knows how to preserve his visual and general health. *E. J.*

PREVENTION OF OPHTHALMIA NEONATORUM

Attention was called to the prevention of disastrous inflammation in the eyes of the newborn by Credé, professor of obstetrics in the University of Leipsic and director of the Lying-in Clinic, in 1881. His method was to instil into the eye of the infant soon after birth a single drop of a two per cent solution of silver nitrate. This proved singularly successful. In that hospital it reduced the number of cases of such ophthalmia from over ten per cent to less than one-fifth of one per cent; and the experience of others fully confirmed its effectiveness. A large part of its value depended upon the fact that it could be applied by obstetricians, general practitioners of medicine, midwives, and nurses, without the supervision of the ophthalmic specialist. The result was that blindness from ophthalmia neonatorum became very much less common.

Other substances, especially the organic salts of silver, have been widely tried to replace silver nitrate. Several have shown some value for this purpose. But, for wide application, and by untrained hands, nothing has proven quite equal to the original Credé method. Wherever the prophylaxis of ophthalmia neonatorum is provided for or required by law, the use of silver nitrate is given exclusive sanction or preference. It has thus come about that the instillation of silver nitrate solution into the eyes of the newborn is widely practised by those who have little if any training in ophthalmology. Under these circumstances, it is very important that whatever dangers or mishaps may attend this method of prophylaxis should be understood, emphasized, and guarded against.

Every powerful drug, applied to the prevention or cure of disease, may at times cause undesirable or disastrous effects. This is true of silver nitrate. It is used extensively in the treatment of conjunctivitis, in the newborn and the adult. Only recently have the investigations of Lindner shown how the reaction of the conjunctiva to gonococcic and other infections opposes and throws off the invasion of the dangerous bacteria by the proliferation and powers of the young epithelial cells. The natural process of cure requires that these cells shall be produced in large numbers, and that they shall not be destroyed or impaired until they have done their work. From the early use of silver nitrate in the treatment of purulent conjunctivitis, it has been observed that applications should not be made too frequently. Each application is followed by epithelial proliferation, but if the new-formed cells are destroyed too soon by another application, the result will be that the mucous membrane will be left without even such protection as would be afforded by the formation of young epithelial cells in the absence of stimulation by silver nitrate. Too frequent applications of silver nitrate hinder rather than help the cure of gonorrheal conjunc-

tivitis. Cases of this kind have been observed by the writer, and attention has been called to them repeatedly in the literature of the subject. But it would appear that the danger from such frequent applications has not been strongly or widely enough emphasized.

In an extreme instance reported by Nance (Ophthalmic Year Book, v. 5, p. 116) the two per cent solution had been dropped in the eyes every two hours for eight hours; and, when the patient was seen at the age of eleven days, the cornea was so opaque that the iris could not be made out, the lids were swollen, the skin stained a dirty black and bleeding readily. The writer has seen the cornea quite opaque, although there was no ulceration, after use of the solution twice daily for a week. Wiener (Ophthalmic Year Book, v. 1, p. 70) saw a case of fatal hemorrhage from the conjunctiva, following the Credé prophylactic instillation of two drops of the two per cent solution. Severe hemorrhage beginning two days after such an instillation, and continuing five days, was reported by Vermelin and Vigneul (Ophthalmic Year Book, v. 20, p. 312).

A very striking case has just been reported by Heal (British Journal of Ophthalmology, v. 12, p. 33). A one and five-tenths per cent solution was ordered by the medical attendant, to be dropped into the eyes three times a day. When the eye was seen thirty-four hours after birth, and after the solution had been instilled five times, blood was oozing between the lids and the left conjunctival sac was filled with firm blood clot. The bleeding was checked by the actual cautery applied to the bleeding points, because it seemed the child was likely to die unless the hemorrhage could be overcome. After five weeks the steamy corneas had become clear. In this case there was no evidence of hemophilia; and the mother did not have gonorrhea, as had been supposed when the prophylactic was ordered.

Such cases are very rare. A report has been made of the use of the Credé method in ten thousand cases "without any bad result". But the claim that in no case is there possible danger from it is too sweeping as regards a method that is to be applied by nurses and by physicians who are not ophthalmologists. Some good observers have found a one per cent solution strong enough to give good results. But when the application is to be made by those who are not experts a wider margin of efficiency is desirable. A stronger solution is more likely to cause irritation; but the great danger is in repeating the application, and is not balanced by any greater efficiency. The silver nitrate application should not be repeated by any one but an ophthalmologist; and he should not make it more than once in twenty-four hours. If these rules are observed the risk becomes very slight. But sweeping statements that there is "no danger" will be found false, and will tend to bring discredit on an extremely valuable measure. *E. J.*

ANATOMY OF EXUDATIVE CHORIORETINITIS

The mystery which envelops a number of disease processes in the ocular fundus is associated with the fact that these disorders do not commonly lead to enucleation of the eyeball, so that with few exceptions no opportunity for histological study arises. As regards the anterior segment of the eye, biomicroscopy facilitates knowledge of some of the pathological changes which were formerly none too clearly understood; but no one has yet found a way to investigate the microscopic, or even the deeper macroscopic, structure of the choroid and retina in the living organism.

In exudative processes there is frequently a good deal of uncertainty as to whether the mass which is seen with the ophthalmoscope is chiefly or entirely of retinal or of choroidal origin. This was especially emphasized by Heine a year or so ago in connection with detailed reports of three cases of so-called external exudative retinitis. In a broader sense, this expression can not be considered as corresponding to a uniform etiology, but merely as describing forms of disease which bear a symptomatic resemblance to one another.

The names of Junius and Kuhnt are attached to a particular variety of this

general group, characterized in the main by the advanced age of the patients, the benign course of the disease, and the ophthalmoscopic finding of white foci in the macular region of each eye, of more or less marked prominence and with frequent retinal or retroretinal hemorrhages. These two authors have emphasized the need for exact microscopic study of every available eyeball in which the clinical condition has been observed.

Paul (Zeitschrift für Augenheilkunde, volume 63, parts 4 and 5) found an opportunity to study anatomically an eye which in several aspects resembled the characteristic cases of Junius and Kuhnt. The patient, a woman of sixty-eight years, suffered from gout and rheumatism, but was otherwise healthy. No evidence of nephritis could be discovered. The patient developed in each eye a disc-shaped central "retinal" degeneration,which remained stationary for many years. After clearing up of an acute massive hemorrhage into the vitreous, one eye suddenly showed renewed and progressive advance in the fundus disorder; and slowly and gradually, in the course of a year, this assumed the dimensions of a new growth lying behind the retina, surrounding the original focus like a rampart, and pushing the retina forward about eight diopters.

Microscopic study of the enucleated eye revealed an exudative choroiditis, which at several places had led to perforation of the choroidal elastic membrane, and at these points had detached the pigment epithelium from the elastic membrane by pressure of hemorrhages and exudates. The chief constituents of this cicatricial mass, in addition to hemorrhagic remains and granulation tissue of choroidal origin, included marked pigment proliferations and unpigmented cell masses which were also regarded as being derived from the pigment epithelium. But for the most part the retina itself had undergone very little change, the inner layers being almost intact. Thus a process which had the clinical appearance of involving the retina was actually found to be of purely choroidal origin. *W. H. C.*

PRESCRIPTION OPTICIANS

Unity of action in any large group of individuals is almost unattainable. This is especially true among physicians. There could scarcely be imagined a more powerful influence on public opinion than that of the medical profession, were the doctors united in their efforts, but they have seldom felt the stimulus to so unite. The very ethics of the profession militate against this, because it requires full time workers and paid publicity and this smacks too much of commercialism to appeal to the physician. Indirect sponsorship of an aim requires some effort but nothing compared to the energy required for direct sponsorship.

For this and other reasons the doctor has failed to accomplish as much as he might toward preventing the passage of bad laws and insisting on the enactment of good laws. A striking example of this is the comparatively easy manner in which numbers of ill advised optometry bills have succeeded. This has been in the face of the fact that probably not one in ten physicians but realizes that refraction should be in the hands of men who have an understanding of the medical relationship of the eye to the body as a whole.

If the refractionist ought to have a knowledge of medicine, either we must make a physician of the optometrist or urge that refraction be done by qualified physicians. It is not alone the doctors of medicine who believe this. The Guild of Prescription Opticians of America maintains that the latter is the better procedure and has gone on record as pledged to refuse to test eyes and as undertaking to refer persons desiring eye examination to an eye physician. If this attitude is correct this Guild deserves the support of the medical profession. In Buffalo, a group of physicians met with the leading opticians of that city and declared their intention to send prescriptions only to those who agreed to dispense solely. As a result there are now eight firms in that city which subscribe to this principle.

The argument here is not whether this is altruism on any one's part, nor is it to convince one that the position

taken is correct; it is merely to call attention to the existence of this group with representatives in many cities and to suggest that if you do believe in what they are trying to establish you ought to support them.

Realize that by their action these opticians have put their future in the hands of the medical profession and that they cannot make a success of this effort without the help of the ophthalmologist. The initiative has been assumed by these opticians. They have thus undertaken the expense and trouble of convincing the public of the wisdom of a medical examination of the eyes; a task which properly belonged to physicians but in which physicians have for the most part failed. Since the offensive has been assumed by these men, let those who believe with them give them support in their effort.

A suggestion by the Guild that the ophthalmologist should use the designation "eye physician" to avoid confusion in the lay mind as between "oculist," "optometrist," and "optician" was dealt with in a former editorial in this Journal (vol. 10, no. 9, p. 705), but the idea seems so valuable that attention is again called to it. *L. T. P.*

SHALL WE USE CYCLOPLEGICS?

The paper by Dr. Wells, read before the Section on Ophthalmology of the American Medical Association, is published in this journal because it has not been afforded the wider circulation commonly given to Section papers by publication in the Journal of the American Medical Association.

While the author's contentions as to principle are unquestionably in agreement with the views and practice of most ophthalmologists, yet, since the basis of the paper is a discussion of the subject which occurred at the London Conference in 1925, it seems proper to call attention to certain details in regard to which Dr. Wells may have misapprehended the trend of that discussion.

Dr. Wells says that Herbert, Brailey, and Traquair agreed with Burdon-Cooper as to omitting cycloplegia. In the discussion as recorded in the Transactions of the Ophthalmological Society of the United Kingdom, Herbert is not shown as saying anything about atropin or homatropin; Brailey is reported as agreeing that atropin is seldom necessary, but says nothing about homatropin; and Traquair is not reported as agreeing in omitting cycloplegia, but as agreeing in the onslaught on the indiscriminate use of atropin. The present writer, although quoted by Dr. Wells as agreeing with Burdon-Cooper that cycloplegia could be omitted entirely, actually said (according to the Transactions) that he had not frequently obtained a higher error without atropin than with, but did quite frequently obtain just as large a hyperopic error without as with atropin, if the test was completed by bilateral fogging. *W. H. C.*

Errata

On page 743, vol. 10, the legend at the bottom of the page, under figure 7, should read "Small necrotic area in the spleen in microscopic section".

In Dr. H. Gifford's contribution in the issue for December, 1927, the third and fourth lines of the second column of page 923 should read: "one-sided irritability of the gland"; and in the ninth line from the end of the same article the word "ones" should be "one".

BOOK NOTICES

Bericht der Versammlung der deutschen ophthalmologischen Gesellschaft in Heidelberg, 1927. Edited by A. Wagenmann. Paper, octavo 522 pages, 144 illustrations, ten in colors. Munich: J. F. Bergmann, 1927.

The reports of the Heidelberg Congress give a better résumé of what has recently claimed the attention of German ophthalmologists than do any other one publication. The German investigator who has written an elaborate account of his studies occupying one hundred pages or more in a monograph, or in the Archiv, comes to the Congress, presents the practical aspect of his observations, or a summary of them, in five or ten pages, and has them discussed by colleagues who confirm or criticize his conclusions. Or the clinical worker brings to this gathering, of the

ophthalmologists whom he esteems most highly, the important case or feature, which he thinks will most likely bring him credit, or link his name to some permanent advance in clinical ophthalmology. And the demonstration session gives opportunity to place before the eyes he wishes to see it the specimen, or microscopic section, the case or new instrument, the pathologic curiosity or improved technic, to which he would direct attention.

In this volume are printed 58 papers, discussed by 79 speakers, and averaging only six and one-half pages for each paper and discussion. The account of the 25 demonstrations is given in 85 pages. When it is considered that among the more than two hundred members in attendance were some of the most active and productive students of ophthalmic science, it becomes clear that this volume is extremely valuable to any library that undertakes to keep up with the expansion of medical thought and medical literature.

The stock subjects of cataract and glaucoma are of course represented; and not merely by suggestions of operative technique. Kronfeld discusses lens nutrition and oxidation; Birch-Hirschfeld the relation of light to the causation of senile cataract, Erggelet and Bruno-Fleischer glass-blowers' cataract, and Siegrist the pathogenesis and medical treatment of senile caatract. With reference to glaucoma, Hertel discusses intraocular pressure and the external coat of the eye. Vogelsang gives a method of measuring the elasticity of the eye; Schmidt deals with the control of pressure in the glaucomatous eye; Römer, experimental hypotony; Elschnig, the origin of glaucomatous excavation; Seidel the method of clinical investigation of glaucoma, and Hamburger the prevention of acute attacks by "glaucosan" treatment. Operative technique is not neglected: Pillat writes of iridencleisis, Kubik on extraction of the lens in its capsule, Meyer on cataract operation with the lance knife, and Paul on the technique for buried sutures.

There are some highly original suggestions in this volume. Paul's buried suture is one of them. Another is that of Lauber, for the ophthalmoscopic diagnosis of hemianopsia. Germany turns with enthusiasm to the task of leading the world in peaceful contributions to the advancement of ophthalmic science. *E. J.*

Chirurgie de l'oeil et de ses annexes. F. Terrien. Third edition, paper, octavo, 654 pages, 565 illustrations. Paris: Masson et Cie, 1927.

This book has been previously noticed (vol. 10, p. 710) but seems worthy of a second mention for its practical value and some special features. In the main the operations here described are those which have an established position in ophthalmic operative surgery. The newer methods of removing the crystalline lens in its capsule, as done by Smith and Barraquer, are fully described, as well as some other recent operations that have found favor in France. Methods of opening the nasal sinuses, lumbar puncture, and the treatment of diseases of the hypophysis are also described.

In certain directions, as the operations on the ocular muscles and the more recent plastic operations done on the lids, there have been important advances in ocular surgery that are not noticed. In these respects the work is not fully up to date. The clearness of the descriptions and the completeness of the illustrations make it a book that the oculist may well study to improve his knowledge of French while he is getting the French point of view regarding many operations that he has heretofore considered from only his single standpoint. *E. J.*

Die Mikroscopie des lebenden Auges an der Gullstrandschen Spaltlampe mit Atlas typischer Befunde. Privatdozent Dr. A. Meesmann, Oberarzt der Universitätsaugenklinik in der Charité, Berlin. Buckram cloth, large octavo, 178 pages, 35 illustrations in the text, and 64 color plates with 210 pictures. Berlin and Vienna, Urban and Schwarzenberg, 1927.

The atlas of colored plates, with explanatory text facing each of the 210 pictures, occupies more than half of this volume. The general understanding of ophthalmoscopy and of the

use of the ophthalmoscope were largely brought about by atlases representing the appearances revealed by that instrument. Biomicroscopy is being made real and familiar to ophthalmologists by the same method; and, among such works presenting this new branch of learning, this one by Meesmann is the best.

Its importance comes largely, as the author points out in his preface, from the pictures by the Berlin artist, Max Landsberg, who became greatly interested in this method of investigation. The general understanding among ophthalmologists of the details and meaning of ophthalmoscopic appearances was largely promoted by Jaeger's and Liebreich's keen observation and skill in reproduction of such appearances. Such a contribution to biomicroscopy we now owe to Vogt and Landsberg.

The book begins with a consideration of slitlamp illumination: I, its character; II, the apparatus; III, methods of study with the slitlamp. Then comes IV, the clinical part, one hundred pages; followed by the bibliography, and the name and subject indexes. Then V, the atlas of typical slitlamp observations in normal and pathologic eyes. The plates and explanations of this part are grouped as follows: conjunctiva, plates 1–3; cornea, 4–19; anterior chamber, 20–22; iris, 23–29; lens, 30–35; vitreous, 56–59; angle of anterior chamber, 60; ocular fundus, plates 61–64.

The section on apparatus deals mainly with that of Zeiss, although the "Kohler-Vogt" method is mentioned, and the Koeppe microscope and instruments of Bausch and Lomb and Fincham. The Czapski binocular microscope is well explained, and the modifications of Henker and Koeppe are illustrated. The methods of using the slitlamp are explained, about as well and briefly as is possible by means of text and illustrations. The student having his own apparatus and taking time to follow out and master the directions given for using it, can obtain a good acquaintance with methods of slitlamp investigation and the details it will reveal. The interpretation of what is seen, as given by the plates of this atlas, is most valuable.

The plates which give peculiar and permanent value to this work are highly successful in reproducing the effect of microscopic observations of the living tissues. Of those showing conditions of the conjunctiva two figures are of pathology of the palpebral portion; and one of normal, and seven of diseased appearances of the limbus. The fifty-seven views of corneal abnormalities constitute such a collection of reference appearances as will be highly useful to the student in working up a more modern and exact knowledge of corneal disease. The pictures of the anterior chamber include deposits on Descemet's membrane and hernia of the vitreous, with changes in the aqueous. Pictures of the iris, 20, the lens, 94, and the vitreous, 11, add materially to the records that have been made by Vogt, Koeppe, and others. The two of the angle of the anterior chamber may serve to bridge a gap between observations ordinarily made by oblique illumination and the pictures of Salzmann and Uribe Troncoso. The twelve fundus pictures add certain details to what is seen with the ophthalmoscope.

Troncoso seems to be the only American writer mentioned in the text, and he only by a reference to his work on gonioscopy. However, in the bibliography ample justice is done to all the papers that have appeared in this journal, by Gradle, Bedell, the Friedenwalds, Gifford, Von der Heydt, Peter and Graves. The index of names, however, contains none of these, giving only authors referred to in the text. Although in another language, this atlas will be very helpful to English readers, for it employs so well the universal language of pictures.

E. J.

Recent Advances in Ophthalmology. W. Stewart Duke-Elder. 343 pages with comprehensive index and bibliography, 4 colored plates, and 73 text figures. London, J. and A. Churchill, 1927. Philadelphia, P. Blakiston's Son and Company, 1927.

This book forms a part of a series covering the advance in all branches of medicine. If the other volumes approach this in excellence of preparation,

the series is indeed a noteworthy one. Works of this character often approach the type that makes the yearly almanac so unpopular, but this cannot be said of the book now under consideration for review. Nor has the scheme of the book been devised so that every writer upon an ophthalmic subject regardless of its value may find his name mentioned. This has been the bane of all year books. It has made them too bulky for ordinary use and robbed them of the respect due so much labor, as well as made the cost a matter that frequently has led to their discontinuance. Instead, in this little book, noteworthy advances alone have been given consideration. The first chapter, for instance, covering forty-two pages, gives detailed consideration to the nature of light, and proves the author to be well informed upon the purely scientific aspects of ophthalmology. It is difficult to obtain in so small a space such a readable amount of information of this character in any of the text books of ophthalmology. Few writers are competent to discuss this subject and the works of the physicists are too abstruse to find a ready circulation among ophthalmic readers. Physiologic optics, which forms the subject of the second chapter, while more familiar than the preceding, does not confine itself to a rehash of old views but rather analyzes newer contentions and provides us with new topics and some new names. The third chapter, dealing with embryology, utilizes to great advantage the information gained by the slit-lamp. Also it is amazing how much detailed experimentation has been undertaken in the field of ophthalmic embryology in the last few years. I. C. Mann's 1927 book upon the development of the human eye is quoted frequently with the compliment that it is perhaps the most comprehensive work on the subject in the English language. In the fourth chapter biomicroscopy, as made possible by the slit-lamp, is given ample consideration. In fact the subject is handled much better than in many books and pamphlets written by the experts in this field. The tyro in slit-lamp technique will find much to interest him in this section of the book. General ocular physiology is considered in chapter five at great length. The circulation, especially the significance of the venous pulse, has been given marked attention. In the section dealing with the aqueous and vitreous humors, as well as intraocular pressure, the reader will be amply repaid by a careful perusal. Tonometry, so frequently dismissed with a paragraph or two, covers seven pages with great advantage. In the section dealing with the diseases of the eye, the pathology of the circulation occupies no minor place. A discussion of the newer conceptions of the significance of retinal hemorrhages is of special interest. Glaucoma offers much for reflection. That the relation between high blood pressure and high intraocular tension is accidental and not of necessity fixed is a new point that is amply demonstrated by the analysis of recent literature. An equally modern development is the frequent association of disease of the arterial system with glaucoma. The other phases of the pathogenesis of the disease admit of no such dogmatic statement, but the discussion of the views advanced makes highly interesting reading. Biochemistry will, doubtless, eventually solve the enigma. The section dealing with the diagnosis of the disease emphasizes features heretofore given scant consideration. In the matter of treatment, the status of adrenalin is given much attention, perhaps more than is justified. Osmotic therapy, especially that in which a hypertonic state of the blood is induced by intravenous saline injections, is also discussed at length. The bibliograph of glaucoma is very comprehensive. Cataract receives elaborate consideration embracing the information obtained by the slit-lamp, the biochemist, and other laboratory workers, and we receive a wealth of knowledge heretofore only speculative in character. An entire treatise could be written around the material here supplied. Sympathetic ophthalmia and ultraviolet phototherapy are not neglected, while the Koeppe lamp, regional anesthesia, nerve block, and so on, are given sufficient emphasis. The neurology of the eye and the psychology of vision, as subjects of considerable recent investi-

gation, are referred to at sufficient length to make the survey complete.

The book is a scholarly digest and competent analysis of a wealth of new observations, and will be found to be of great value to those interested in the subject. *L. Webster Fox*

Haajin ("the eye"—Hebrew). A. Feigenbaum, oculist to the Hadassa Hospital, Jerusalem. Cloth, octavo, 308 pages, 242 illustrations. Hamadfith Publication Company, Jerusalem.

This very interesting textbook, written for the Hadassa School of nurses, concerns us mainly because it is a modern ophthalmic textbook in the Hebrew language. It compares well with any book of its kind in any other modern tongue. In fact this volume will serve well not only for the instruction of nurses, but also for the general practitioner, and for beginners in ophthalmology.

The author deserves to be congratulated for presenting a very clear and concise description of the various diseases of the eye in what was lately considered a dead language. The recent renascence of the Hebrew language as a living and spoken tongue has made this volume possible. Only the student of Hebrew literature can appreciate the difficult task of the author, who clearly manifests not only a complete knowledge of ophthalmic science, but likewise a familiarity with ancient talmudic and modern literature. A rare combination indeed! The entire field of ophthalmic literature, with all its ramifications, is clearly stated in this volume of 308 pages. Appended is a German-English-Hebrew glossary which makes the book accessible to any Hebrew student. The work, which the author dedicates to his teacher, the late Professor Julius Hirshberg, is divided into a number of chapters, and has a very systematic arrangement, laying particular stress on the various eye conditions endemic in Palestine, and giving more space to the diseases common in that locality.

An interesting chapter is on the various home remedies which depend mainly for their potency upon the superstitions of the East, and on the quackery of various unschooled charlatans, which is a great drawback to the advancement of rational ophthalmology.

The titles of the various chapters will at once give us the idea of the thoroughness of this work.

Chapter 1, on the anatomy of the eye, and chapter 2, on the physiology of the eye, are rather brief, but give a clear conception of the subject.

Chapter 3, on the commoner diseases of the external and internal parts of the eye, includes the pathology of the lids, conjunctiva, cornea and sclera, and uveal tract, and the study of the bacteriology of the eye. Very little space is given to gonorrheal conjunctivitis, for the author says "that it is very rare in Palestine." On the other hand, considerable attention is given to granular conjunctivitis or trachoma, as this disease is very common. Egyptian ophthalmia is discussed separately as a common disease in Egypt, so the author probably considers Egyptian ophthalmia an entirely different condition from trachomatous conjunctivitis.

The appended table shows a great improvement as to trachoma. This disease has been reduced from 75 per cent in school children in 1914 to about 8 per cent in 1924. The higher schools show very little trachoma. The Arabian schools still have a very large trachoma index, while the modern Hebrew schools show a very low percentage.

Chapter 4 discusses the various ocular conditions observed in general diseases. In chapter 5 the subject of refraction is well stated and illustrated. Strange it is, however, to see that the reading charts are in Latin script and not in Hebrew. A special chapter on ocular hygiene deserves special credit, and numerous rules of a hygienic nature are given for the prevention of eye diseases.

The eighth chapter deals with prevention of blindness, with special reference to the causes which are common in that locality. The chapter on history of ophthalmology shows the author's familiarity with the early development of ophthalmic science.

In the chapter on therapeutics the author mentions all forms of therapeutic agents employed locally by instillation, and the various methods

of intramuscular, intravenous and hypodermic injection, so familiar to all of us. Milk injections and non-specific protein injections are given rather undue prominence.

The theoretical and practical nursing aspects of ocular treatment are well stressed by the author, and rightly so as modern nursing is an innovation in this ancient country. The weakest chapter is the one dealing with the disturbances in ocular motility, but this is pardonable considering that the book is written expressly for nurses. The surgical treatment is clearly stated, and great stress is laid on postoperative treatment.

Considering the problem of finding proper words to convey his meaning and the necessity of coining new words suitable for the subject matter, one must say that in thus giving a modern text book in an ancient tongue the author has faithfully discharged a difficult task that must have required years of hard labor. This, the first modern medical book in the holy land in the holy tongue, is so well done that it holds out a realizable hope that new textbooks in the Hebrew language will soon make their appearance. To the author we can only say: "Well done thou faithful servant of thy people."

The publication of the book was facilitated by the American branch of Hadassa, workers to whom the author in his preface expresses his gratitude. The medical school of the Hebrew University, which is sponsored by American Jewish physicians, may proudly share in this first fruit of its influence to help the rejuvenation of Palestine. *Aaron Brav*

Nerve Tracts of the Brain and Cord. William Keiller, F.R.C.S. (Edinburgh). Professor of Anatomy and Applied Anatomy, University of Texas. New York, Macmillan and Company. Price $8.00.

The author's object in publishing this book is to present the subject in such a manner as to enable students to approach nervous diseases while thinking in terms of anatomy, physiology, and pathology as applied to the nervous system. It is divided into three parts. Part one supplies a laboratory manual for the study of the nerves and tracts in the nervous system. Part two gives a summary of the anatomy and physiology of the nerve tracts based on autopsy findings in clinical cases. Part three summarizes the leading features of the better known nervous diseases, correlating their symptomatology with anatomical, physiological, and pathological data.

The book has 456 pages. It is profusely illustrated, with many excellent anatomical drawings, and diagrams, and the subject is clearly presented. The volume embraces the whole field of neurology and is a good reference book on neurology for the library of the ophthalmologist. *W. C. F.*

Bulletin et Memoires de la Société Française d'Ophtalmologie, 1927. Paper, 613 pages. Published under the editorship of a committee of the Society by Masson et Cie, Paris.

This volume is a report of the 1927 meeting at Paris. It contains also an index of volumes XXXI to XL. The first part contains the constitution and by-laws, an alphabetic and geographic list of members, and the minutes of the meeting. The formal report for the year is on the rôle of the sympathetic in ocular pathology, 192 pages, by P. Bailliart, discussed by eight of his colleagues. It is a very voluminous report on all phases of the question and contains several illustrations. There are forty-four shorter papers, which take up a wide variety of subjects and represent studies by most of the prominent ophthalmologists of Paris and other French cities. Nearly all these papers are discussed by prominent colleagues. This volume can be said to convey the latest thought of French ophthalmologists, better than do the proceedings of most national ophthalmic organizations.

C. L.

Lehrbuch der Augenheilkunde. Prof. Ernst Fuchs. Fünfzehnte, vermehrte und verbesserte Auflage, bearbeitet von Dr. Maximilian Salzmann. Mit 347 Abbildungen und Tafeln. Leipzig und Vienna,

Franz Deuticke, 1926. Price 20 marks.

(Dated 1926, but copy lately received from the publisher with request for review.)

This is the fifteenth, enlarged and improved edition in German of a textbook which, in spite of keen competition by the native ophthalmologists of various civilized countries, has for a long time been probably the most widely used work of its kind in the world. The new edition still carries the famous preface to the first edition, in which Fuchs tells of the origin of the work in the universal custom by which diligent German students recorded their teachers' language on paper; of his (Fuchs') objection to this system as detracting from a full appreciation of the subject rather than contributing toward it; and of the little trick that medical graduates have, of keeping their notes from student days for reference in actual practice.

Salzmann, then Fuchs' clinical assistant, now professor of ophthalmology in the University of Graz, made the majority of the drawings for the excellent woodcuts which graced the first and later editions; and in undertaking the general task of revision, he embellished the work with five plates carrying forty splendid colored illustrations of the ocular fundus—magnificent specimens of the printing art.

The volume as received is bound only in paper, following the common practice on the European continent, according to which the owner of the volume selects a style of binding (if any) which harmonizes with the rest of his library.

W. H. C.

Die Funktionsprufüng des Auges für Studierende und Ärzte. Dr. Anton Elschnig, Prag. Third revised edition with 68 figures in text. Leipzig und Vienna, Franz Deuticke. Price 6.60 marks.

This 182-page paper-bound volume (in German) on functional testing of the eye was originally written by Professor Elschnig in 1896, when he was a pupil of Schnabel. The third edition (dated 1923) does not present any marked variations from the original edition. The order of statement is as follows: examination of refraction, accommodation, and visual acuity; visual field; color sense; light sense; testing eye with opacities of media; pupil movements; lid movements; oculomotor apparatus; simulation of functional disturbances. The reviewer has never seen a clearer statement of the subject, or a more straightforward series of mathematical and practical definitions. Various optical aids in high amblyopia are dealt with. Retinoscopy is very clearly explained, especially in the suggestions as to how the student may illustrate to himself, by simple means, the principle involved. The book abounds in simple yet effective diagrams. *W. H. C.*

Optotypy, dle Eduarda Jaegra z Jaxtthalu, pro ceske lekare, usporadal Prof. Dr. Schöbl. Druhe vydani. Leipzig and Vienna, Franz Deuticke.

This is a series of test types, apparently in Czechoslovak, for the estimation of visual acuity in close work. Dated 1924, but recently received from the publisher, it is mentioned here because it may have a sphere of usefulness in some polyglot sections of the United States. *W. H. C.*

CORRESPONDENCE

Wanted: A Definition of Blindness

To the editor:

Although the word "blind" is used so frequently in ophthalmic literature, as also by insurance companies and in common parlance, it is rather difficult to find any generally accepted definition of it. Those who pay damages like an insurance company have the terms as much restricted as possible, while those who are to be paid would have it as elastic. Thus industrial blindness may mean nothing or anything.

It is quite time that we English speaking ophthalmologists should have some more exact and universal definition. The test object for whatever amount of vision does exist should be simple and always available. Although the usual test letters naturally suggest themselves first, they are not always at hand, and the balls or marbles of various size which we roll on the floor

to test the vision of children are also unreliable. Without going into detail by showing other objections to the tests used in one country or in one clinic as compared with another, it seems worth while to suggest a simple test always available, in order to ask what better one if any can be proposed. Then, after the present suggestion has been criticized, if its faults are so numerous and have been so thoroughly exposed as to make the suggestion useless, it may be worth while for the Section on Ophthalmology of the American Medical Association, or for some similar body which speaks with authority, to decide upon a definition which will serve our purpose.

The suggestions which have occurred to me are as follows: First: By blindness of an eye we are to understand its inability under the best conditions of light, position, etc., to count the fingers of the examiner at a distance not to exceed one meter or one yard. This is practically an arm's length. With so little vision still remaining a few centimeters make no practical difference.

Second: By the term "partial blindness" we may understand the ability under good circumstances and with best correction, to count fingers of the examiner at not to exceed three meters, or about the equivalent in feet.

The terms "perception of light" and "total blindness" explain themselves.

If any concise and exact definition of blindness has been proposed and adopted by any authoritative body, probably the readers of the Journal would be glad to know where and when that occurred. If not, the above suggestion may serve as a basis for future discussion and give us, later, one more definite term among the many used without real meaning.

Lucien Howe

Boston, Massachusetts

The Lens in Accommodation

A statement by Dr. E. E. Blaauw published in November called forth a reply from Dr. W. H. Luedde and a further letter from Dr. Blaauw, and essential parts of both replies are now published at the request of the two correspondents:

My dear Doctor Blaauw:

In your correspondence published on page 868 of the American Journal of Ophthalmology I find a quotation imputed to me as follows, "the slottering of the lens, the only thing Hess did." I am utterly unable to identify these words with anything I have said or written on this subject.

It should be needless to add that I disclaim any intention to express a sentiment derogatory to Professor Hess, although I do not accept some of his conclusions regarding the mechanism of accommodation.

I had the privilege of knowing Professor Hess and of visiting him at his clinic in 1905 at Wurzburg. When he visited the United States in 1907 I was directed by my chief, the late Dr. John Green, Sr., to act as his special guide during his stay in St. Louis. . . . . His personal charm, supplemented by his kindly letter in appreciation of my efforts after his return to Germany, gave him a special claim on my affection and respect that can not be usurped by controversial differences.

Will you please help me to clear up any misunderstanding that might be created by your comment.

Very sincerely,

W. H. Luedde

My dear Dr. Luedde:

You are right. I am a poor stylist. But that "the only thing Hess did" should be taken literally was very unforeseen.

. . . . . .

I am more than sorry that I have failed and roused your anger. I have tried to remain impersonal, to stick to facts. Will you take my apology, as it is meant—I never have had any intention to quote you wrongly or hurt you. This is the last thing that occurred to me.

With personal regards,

Collegialiter yours,

E. E. Blaauw

ABSTRACT DEPARTMENT

Abstracts will be classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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9. CRYSTALLINE LENS

Burky, Earl L., and Woods, Alan C. **Lens protein: new methods for the preparation of beta crystallin.** Arch. of Ophth., Jan., v. 57, p. 41.

This paper describes new methods which are more rapid, with more assured results, and offering greater yields than any methods previously described. *M. H. Post.*

Butler, T. Harrison. **A case of monocular diplopia.** Brit. Jour. of Ophth., 1927, v. 11, Nov., p. 563.

A man aged 54 years who for ten years previous to observation had had double vision in the right eye. R.V. with —1. sph.+4. cy. ax. 95°=⅚₀. Careful examination including Placido's rings failed to demonstrate any irregularities. The slit-lamp clearly showed the cause. There was present a large fluid-cleft in the horizontal diameter across the lens occupying the whole depth; thus dividing the lens into an upper and a lower segment.

D. F. Harbridge.

Ellis, Zenas H. **Nonoperative treatment of cataract with report on lens antigen treatment.** Arch. of Ophth., 1928, Jan., v. 57, p. 40.

This paper is the report of an attempt made at the clinic of John M. Wheeler, at Bellevue Medical School, Bellevue Hospital and the New York Eye and Ear Infirmary, to reproduce the work of A. E. Davis in the treatment of cataract with serum.

Davis has evolved the theory that a solution of emulsified lens substance from an animal, injected into a human being, will cause formation of antibodies, which will absorb lens opacities. The author does not understand the reasoning which led Davis to the conclusion that such injections would affect abnormal lens protein, but rather fears the production of cataract in the offspring of patients so treated. Probably, however, most cataract cases have passed beyond the child bearing period, so that this unfortunate result is not greatly to be feared.

In all, twenty-seven cases were treated. There were two cases of traumatic cataract, fifteen of cortical, five with sclerosed nucleus, four diabetic, and one complicating glaucoma. In fourteen the cataract continued to progress, in thirteen it remained stationary. Absorption as seen with the slit-lamp took place in none, nor was the vision improved in any.

One case suffered anaphylactic shock after the thirtieth injection, and in about one-fourth of all those treated there was a mild dermatitis at the seat of the injection. *M. H. Post.*

Stoewer, Erich. **Glassblower's cataract as an occupational disease.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 243. (3 ill.)

By means of the slit-lamp and ophthalmoscope Stoewer examined about 2,000 laborers occupied at glassblowing furnaces. In young workers, during the first few years of occupation in the glass industry, no lesion visible in the lens is produced. Up to the forty-fifth year occupational opacities of the lens are rarely encountered, but the lens passes through a prematurely senile process, which may manifest itself in premature presbyopia. In the sixth and seventh decades of life typical lens opacities, or detachment of the anterior capsular lamellae, due to exposure to the furnace, are found in the majority of the laborers, but only a small percentage of those who begin there reach this age at the glass works. The lesion does not necessarily always cause impairment of vision or inability to work. Corresponding to the frequency at different periods of life is the occupational age of those affected. Up to the twentieth occupational year no effect was noted, to the thirtieth year slight lesions, and subsequent increase with the number of occupational years to ninety percent of involvement.

C. Zimmermann.

Tennent, J. N. **Cataract extraction with peripheral iridectomy. Lancet,** 1927, v. 213, Dec. 2, p. 1174.

The history of this operation began in 1871, with C. Bell Taylor's operation, in which the lens was removed through "the peripheral section of the iris without injuring the pupil". But most operators have followed the method of Dr. H. B. Chandler (1890), who made the small iridectomy before removing the lens through the natural pupil. Pflüger (1897), followed by Hess and others, made the iridectomy after removal of the lens. Prolapse of the iris after this operation is very rare. Barkan reported but two such cases of prolapse among 180 cases of the operation in Meller's clinic. Tennent reports two cases that illustrate how iris pigment may be found in the cornea or under the conjunctiva after this operation. There are cases in which excision of the whole width of the iris, total iridectomy, is the better operation. Indications for total iridectomy are: increased risk of infection as lacrimal conjunctivitis, high pigmentation of the iris supposed to show increased toughness, intumescent cataract, high myopia, and fluid vitreous. In other cases extraction with peripheral iridectomy will largely replace simple and the older combined extraction, since it combines the advantages of both. In performing peripheral iridectomy the whole thickness of the iris should be removed, because pigment epithelium lodged in the wound may interfere with healing. But the forceps seizing the iris should not be pressed so deeply as to seize the vitreous also.

E. J.

Tyson, Henry H. **Lenticonus posterior.** Arch. of Ophth., Jan., 1928, v. 57, p. 38.

This paper does not lend itself to abstraction, as it hinges about the beautiful illustration of the condition reported. The author points out that true lenticonus posterior is very rare, the literature showing about six cases altogether. The diagnostic signs are the "oil drop appearance" surrounded by a variable shadow, with a great increase in the refraction, usually high myopia, measured through the center of the conus as compared with the adjacent or surrounding lens area. The Purkinje images are another very valuable aid in its determination. Finally, the slit-lamp has enabled us to study the changes in the posterior lens capsule and cortex in detail in a way not previously possible.

The author does not discuss the etiology of the condition. *M. H. Post.*

10. RETINA AND VITREOUS

Altnow, H. O. **Eyeground in vascular diseases and related conditions.** Arch. of Internal Med., 1927, v. 40, Dec. 15.

An internist of twenty years experience studied 187 cases of hyperthyroid,

diabetic, nephritic, hypertensive, and cardiac disease, with especial reference to retinal arteriosclerosis.

The study of twenty cases of thyroid disease, with increased basal metabolism, showed a rather striking absence of retinal arteriosclerosis when patients in the sixth decade were eliminated. In 47 diabetic patients over twelve years of age, with and without hypertension, the incidence of definite retinal arteriosclerosis was 36.1 per cent in the latter and 18.8 per cent in the former. These observations indicate that hypertension may play an important rôle in diabetes. The average age of diabetic patients with definite retinal arteriosclerosis was 57.7 years; while in patients showing doubtful or no retinal arteriosclerosis the average was 33 years. Sclerosis of the small vessels may be an important factor in the production of diabetes after 50 years of age.

Sclerosis of the choroidal vessels is more frequent in diabetes than in the other conditions studied. Changes in the disc are infrequent. With abnormally red retina, numerous small round hemorrhages, groups of small yellowish-white and grayish-white spots on the central field of the retina, arteries with sclerotic changes, well defined sclerosis of the choroidal vessel in the periphery, in a person past middle life, we should strongly suspect diabetes.

In a small series of cases of acute and subacute nephritis, retinitis was conspicuous by its absence. The two patients with retinitis both had hypertension. Retinitis occurs with greater frequency in chronic nephritis than in vascular hypertension. Renal retinitis presents certain changes, such as marked papilledema, retinal edema, cotton wool spots, and coarse fan and star formation that suggest renal involvement. In retinitis caused by hypertension, these changes are less frequent, but all may occur. Retinitis resulting from hypertension may therefore be indistinguishable from renal retinitis. The changes in the eyeground in both instances result from vascular change and diminished blood supply to the retina.

A study of the changes in the eyegrounds in fifty-six patients with and without hypertension, in whom chronic myocarditis was either the primary or the important secondary diagnosis, revealed the presence of definite renal arteriosclerosis in 91.2 per cent of the former and in 68.2 per cent of the latter. In chronic vascular disease that had developed on a rheumatic basis, retinal arteriosclerosis was absent in two-thirds of the cases; and when definite retinal arteriosclerosis was present it occurred in association with elevation of the blood pressure, and in patients who had reached an age when degenerative changes in the vascular system might become manifest.

E. J.

Butler, T. Harrison. **Three cases of embolism of a retinal artery.** Brit. Jour. of Ophth., 1927, v. 11, Nov., p. 559.

The author's first case was in a man aged twenty-one years, examined two hours and twenty minutes after the occurrence. For some time the patient did not have light perception; but vision began to improve. The superior artery was filled with blood as far as the first fork. The two branches were empty for one quarter of a disc diameter and beyond this the blood column was segmented. General retinal edema was present. Five hours after a paracentesis, massage, and the use of amyl nitrite, the empty vessel had disappeared and the block was far away in the periphery. Four days later the obstruction could no longer be seen. Vision=6/6.

The second case was in a man aged thirty-one years. The whole retina was edematous except a triangular area, the apex of which was the macula and the base the disc. This area was fed by a cilioretinal vessel. The macula showed a cherry red spot. About five weeks following the same treatment as in the first case the retina appeared normal. Vision was not improved and

the disc showed evidence of atrophy.

The third patient, a woman aged sixty years, showed just beyond the first fork of the inferior temporal artery a bright embolus blocking a branch to the macular region. There was a total paracentral scotoma but no retinal edema. *D. F. Harbridge.*

Comberg, W. **Visibility of the yellow color of the macula in ordinary light reflected by the mirror.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 479. (2 ill.)

In a woman aged forty years, who had for years been treated and observed on account of circummacular tuberculosis of the retina, a delicate white ring developed at that place. The retina became detached and carried this cicatricial ring forward with it. From the inner margin of the ring a glistening yellow color extended over the anterior surface of the scar, almost as intense as in red-free light. By the detachment of this part from the underlying structures proof is given that the inflammation was confined to the retina and that the yellow color was retinal. *C. Zimmermann.*

Goldfeder, A. E. **Heredity of Tay-Sachs disease.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 176.

The author reports the clinical history of a girl of sixteen years affected with Tay-Sachs disease, who died after four months. The heredity is illustrated by a genealogical tree of the patient's family. The author concludes that Tay-Sachs disease is undoubtedly a hereditary affection of recessive character, not confined to a particular sex. The hereditary succession most probably follows Mendel's laws in monohybrid dissociations. The true infantile form seems to occur in Jews, especially those from Russia.

C. Zimmermann.

Kukán, Franz. **Retinochoroidal arterial and venous anastomosis after contusion of the eyeball.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 226. (2 ill.)

On the third day after contusion, retinal detachment and commotio, with chorioretinal rupture, were observed, with a corresponding defect in the visual field. The patient was a boy aged twelve years. After three weeks, 1.25 disc diameters from the disc the normally filled superior temporal artery appeared and the normally filled superior temporal vein disappeared at the margin of the rupture, the artery forming an almost complete right angle. Probably the artery and vein, in their original normal course, had had a capillary connection with the vascular system of the choroid, which after rupture and closure of the main channel became ectatic, conducting the blood stream in the direction of the choroid.

C. Zimmermann.

Streiff, J. **Pathological sensation of after images.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 474.

Streiff reports three cases in which the persons complained of long persistence of after images. He himself had the same experience after a period of nervous exhaustion. Later on the symptom disappeared completely. He ascribes it to a central cause. It is not improbable that the occurrence of after images and dark adaptation are in direct relation. *C. Zimmermann.*

Ten Doesschate, G. **Retinitis exudativa externa.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 505. (3 ill.)

In a boy aged eight years, a complete fibrous subretinal ring around the disc, and in a man aged seventy-eight years, extensive necrosis of the sclera, were found. In both cases the eyes were enucleated on account of glaucomatous pain. The microscopic changes described in detail, in the two patients of such different ages, seem to indicate that retinitis exudativa externa is not a disease per se, but a reaction of the retina to very different affections. A local change of the vessels in the boy and the arteriosclerosis in the man were probably the exciting factors. *C. Zimmermann.*

Van Heuven, J. A. **Some remarks on Lagrange's surgical treatment of detachment of the retina.** Brit. Jour. of Ophth. 1927, v. 11, Dec., p. 593.

This author reports his observation of forty-seven eyes which he treated by Lagrange's method of colmatage. He also gives his experience in increasing intraocular pressure in experimental work on animals with the same procedure. Favorable results are not to be expected in cases of long standing or in myopic eyes. Traumatic cases respond most favorably, remaining so permanently. The increased intraocular pressure had a good effect, in counterdistinction to the low tension present in eyes treated by older methods. Immediately following colmatage there is a fall in tension which lasts several hours, then tension gradually returns to normal, and finally reaches a value in excess of normal. As a result of the author's experiments on animals, he found that the percentage of albumen in the fluid of the chamber increased after colmatage but he questions whether this is wholly responsible for the increased intraocular pressure. The caliber of the blood vessels is a factor which demands careful consideration. Lagrange's opinion that increase of pressure after colmatage is caused by a constricting ring formed by cicatrization has never been definitely proved.

The inference that by virtue of the increased intraocular pressure the retina is pressed against the wall of the eye will require further investigation before it is confirmed.

D. F. Harbridge.

Verwey, B. C. de la F. **Arteriosclerosis of the retina and its importance for the production of albuminuric retinitis.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 148.

From his anatomical examinations of twenty-four eyes the author concludes that in advanced cases of arteriosclerosis, with involvement of the arterioles of kidney, spleen, pancreas, and liver, and also of the brain and retina, the disease takes on the character of a disturbance of metabolism in the sense of increased imbibition of albuminoid and lipoid substances by the vessel walls. Incidental accumulations of cells around the vessels are of reparative, not inflammatory and defensive, character. The changes in the arterioles of the optic nerve and retina are responsible for the retinal changes. The latter consist of edematous and hemorrhagic foci in the retina dependent upon the vascular disease, with secondary fatty degeneration of the supporting fibers and the formation of free fat and granules in the cells. Albuminuric retinitis is essentially best characterized as retinomalacia arteriosclerotica.

C. Zimmermann.

Wildi, G. **New formation of bloodvessels in the fundus.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 219.

Wildi observed new formation of bloodvessels in the fundus of a man aged fifty-three years, with diabetes and decompensated heart trouble and hemorrhagic retinitis, probably due to obstruction of the central vein. He saw the same condition in a man aged fifty-two years whose hemorrhagic retinitis was due to an obstruction of the central vein. Both had arteriosclerosis. In the first case the new-formed bloodvessels projected far into the vitreous and numerous glomeruloid and looped vessels overlay the peripheral fundus vessels. In the second case the new formed tortuous and ectatic vessels formed a dense convolution immediately in front of the disc. There was no lues. After the vascular network was completely established, a hemorrhage occcurred in the vitreous, undoubtedly from the new-formed vessels. In the second case the condition was observed to progress in the course of one and a half years, but after another year none of the new-formed vessels was longer visible. The clinical picture differs entirely from that of retinitis proliferans and angiomatosis rêtinæ. Everything points to a local degeneration of the vessels of the fundus, due to arteriosclerosis or lues.

C. Zimmermann.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Gasteiger, H. **Disturbances of dark adaptation in diseases of the optic nerve, and their diagnostic value.** Klin. M. f. Augenh., 1927, v. 78, June, p. 827. (3 ill.)

Normal adaptation speaks more for choked disc, diminished dark adaptation more for an inflammatory affection. A determination, however, can only be made with the aid of other methods of examination. The same holds good for distinction between pseudoneuritis and neuritis. Restoration of diminished dark adaptation indicates that the acme of inflammation has passed and an improvement of the other visual functions is to be expected. Gasteiger always found diminished final values of dark adaptation in tabetic atrophy of the optic nerve, in other kinds of atrophy, in normal conditions, and with operative disturbances. Hence in an atrophy whose etiology is not clear a conclusion from the behavior of dark adaptation can only be made if it is normal.

C. Zimmermann.

Giesler, Friedrich, and Wolff, Kurt. **Xanthopsia after digitalis.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 203.

A laborer aged ninety-six years suffered from chronic myocarditis and angina pectoris, which was relieved by verodigen (gitalin), a component of digitalis. After taking 0.8 gm. three times a day for six days, xanthopsia occurred with stomach disturbance, both symptoms disappearing six days after discontinuance of the drug. Even without other symptoms, xanthopsia following the use of digitalis preparations is a sign of intoxication which should govern therapeutic measures.

C. Zimmermann.

Lagrange, H., and Mathieu, P. **Acute optic neuritis and maxillary sinusitis of dental origin.** Bull. Soc. d'Opht. de Paris, 1927, no. 6, July, pp. 279-282.

The patient was a woman of thirty-eight years. The vision of the right eye had fallen to one third, and the visual field of this eye was contracted. The vision of the left eye was normal. Radiography showed great opacity of the right maxillary sinus. A large core ("bourbillon") was removed through a trephine opening in the sinus. Culture disclosed a streptococcus of the hemolytic series, and antistreptococcic autovaccine was resorted to. A juxtapapillary hemorrhage was rapidly absorbed and the vitreous cleared up, the vision of the affected eye becoming normal two months later. *W. H. C.*

Usher, C. H. **Two pedigrees of hereditary optic atrophy.** Brit. Jour. Ophth., 1927, v. 11, Sept., p. 417.

This is a very complete and searching investigation. In the first pedigree five generations, and in the second six generations are carefully recorded. The first pedigree shows eight cases of the disease, one of which was in a female. The age of onset ranged from seven to forty-five years. The second pedigree contains a series of sixteen individuals affected, fourteen males and two females. Thirteen were examined and three warranted assumption. The pedigree concerns six generations: all affected individuals were in two generations. The age range of onset was from eighteen to thirty-eight years. The author has collected and studied the pedigree of three hundred and sixty-one individuals, which he has set forth in diagram. *D. F. Harbridge.*

White, Leon E. **Disturbance of the optic nerve caused by malignant disease of the sphenoid.** Arch. of Otolaryng., 1927, v. 6, pp. 361-365.

Malignant disease of the sphenoid has been found twice in 125 patients, but probably occurs much more rarely than this would indicate. It was associated with gradual unilateral loss of vision. There was little general incapacity or pain until within a month or six weeks of the end. A central scotoma for color was found in one case, and temporal vision was better than nasal in the other. There was apparently no special pituitary disturbance, pallor of the optic nerves, or hemianopsia. Early roentgenograms

were negative, while later ones showed destruction of the sphenoid. Optic atrophy apparently did not occur in either case.

The bony barrier between the brain and the nose was gradually broken down by the malignant growth, so that bacteria eventually gained access to the meninges and thus terminated the patient's suffering.

Treatment with radium should be given a trial. *W. H. C.*

12. VISUAL TRACTS AND CENTERS

Bailliart and Blum, J. **Tonic lateral ocular crises and paralysis of convergence, of encephalitic origin.** Bull. Soc. d'Opht. de Paris, 1927, no. 2, Feb., pp. 66-70.

As a postencephalitic ocular syndrome, the patient, a boy of fourteen years, experienced during fatigue (usually after reading) a turning of both eyes to one side, usually the right but sometimes the left; the eyelids began to blink; and the head was also inclined to one side and slightly backward. If the patient succeeded in overcoming the hypertony of the muscles momentarily, the eyes returned almost instantaneously to their previous position and became immobile. The phenomena diminished after the patient closed his eyes or went to bed, and disappeared after he succeeded in going to sleep. There was also failure of convergence at close range, and the attempt at convergence was accompanied by turning outward of one eye, usually the right. Yet with the diploscope distant binocular vision was normal. *W. H. C.*

Esser, A. Albert M. **Predominance of one eye in right and left handedness.** Klin. M. f. Augenh., 1927, v. 78, March, p. 332.

A child of three years and two months had convergent squint, mostly of the right eye. Atropin and bandaging were ordered for exclusion of the the left eye. After three months the mother stated that the former left-handedness had now turned into right-handedness, but the original condition returned after the left eye was freed. This experiment was repeated several times with the same result. Hence Esser concludes that the left-handedness was not due to a central cause, in the brain, but to a peripheral cause, in the eye. It showed that predominance of one eye and right and left-handedness are in reciprocal relation.

C. Zimmermann.

Foggie, W. E. **Aneurism of the carotid in the cavernous sinus.** Edinburgh Med. Jour., 1927 v. 34, Nov., pp. 649-657.

A woman of 56 years developed a sight ptosis of one eye, and after a few months presented a paralysis of the third, fourth and sixth nerves of the same eye with, as a consequence, a total ophthalmoplegia (both internal and external). There was in adition a slight optic neuritis in the same eye. Further, there was an involvement of the fifth nerve in part—anesthesia and neuralgia in the ophthalmic division, and hyperesthesia in the second division. For the time being the condition appears to be stationary.

The complete syndrome represented by the combination of paralyses of the third, fourth, sixth, and the ophthalmic division of the fifth, points to a lesion at the back of the orbit before these nerves pass through the sphenoidal fissure. The site of such a lesion is to be found in the cavernous sinus in its short course of three quarters of an inch backward from the sphenoidal fissure to the apex of the petrous portion of the temporal bone. *W. H. C.*

Frogé. **Superior horizontal hemianopsia, and linear chorioretinitis.** Bull. Soc. d'Opht. de Paris, 1927, no. 2, Feb., pp. 60-6.

The chorioretinitis appeared in three long lines, radiating irregularly from the disc. The superior horizontal hemianopsia was not accompanied by any clinical sign pointing to the region of the chiasm, and radiography of this region was negative, so that the hemianopsia was to be localized in the calcarine region. *W. H. C.*

Halbertsma, K. T. A. **Disturbances of the visual fields after traumatism of the skull.** Klin. M. f. Augenh., 1927, v. 78, June, p. 779.

A woman aged 41 years fell down stairs three years ago striking the back of her head, with loss of consciousness. Soon her vision was impaired. She now has a small, round absolute scotoma in each eye with concentric contraction of the visual fields. The roentgen plates showed a shadow at the posterior surface of the sella turcica. Apparently the central projections on both maculæ in the cortices of the occipital lobes were directly or indirectly damaged by an intracranial hemorrhage from the blow on the occiput. Absorption of the hemorrhage was assumed to explain disappearance of the headache and vertigo, and improvement of vision.

In a case of injury of the right parietal bone an absolute sector-shaped central scotoma and enlargement of the blind spot were found in both eyes. The roentgen plates showed numerous dark round spots at the convexity of the right hemisphere, apparently hemorrhages. In the course of a few weeks the extension and intensity of the central defects of the visual fields underwent marked reduction. A lesion of the cortex by contrecoup seemed most likely. Theories of central projection of the macula are discussed.

C. Zimmermann.

Magitot, A.,, and Hartmann, E. **Cortical blindness.** Bull Soc. d'Opht. de Paris, 1926, no. 8, November, pp. 427-545.

This monograph of 114 pages (with a bibliography of five pages) does not lend itself to abstract. It covers the subject under the following heads: introduction; the visual cortex; limits and definition of cortical blindness; anatomical clinical material; anatomicopathologic remarks; clinical study (symptomatic triad, accessory symptoms, and associated symptoms); clinical forms (etiologic, evolutive); diagnosis. *W. H. C.*

Okinczyc, J., and Renard, G. **Case of bitemporal hemianopsia from cranial fracture.** Bull. Soc. d'Opht. de Paris, 1927, no. 6, July, pp. 262-265.

After an automobile accident, the patient, a woman of twenty-four years, was in coma for forty-eight hours, and then showed bitemporal hemianopsia and paralysis of the right oculomotor nerve. Radiography revealed the existence of a line of fracture passing from the vertex into the right frontoparietal region and on into the base, without the exact course being clearly shown. The vision of both eyes and the movements of the other were temporarily affected. The chiasmal symptoms were attributed to a hematoma behind the chiasm. *W. H. C.*

Schiff-Wertheimer, S. **Homonymous hemianopsia in the course of pregnancy.** Bull. Soc. d'Opht. de Paris, 1927, no. 3, March, pp. 147-150.

There were no other pathological manifestations, and in particular no clinical or laboratory evidence of renal deficiency. Anatomically, the disturbances are explained on the basis of spasm of the posterior cerebral arteries or of the branches. In the first patient, the arterial spasm, at first bilateral (so as to produce a half hour of complete blindness), underwent fairly rapid retrogression in the right hemisphere, so that no permanent lesion resulted, while in the left hemisphere it persisted long enough to cause a permanent right homonymous hemianopsia.

W. H. C.

Wolff, Julius, and Globus, Jos. H. **Progressive amaurosis of retrobulbar origin.** Arch. of Ophth., 1927, Nov., v. 56, p. 576.

The authors present three cases of central scotoma, accompanied by hemianopsic fields, relative in degree, and requiring careful perimetric examination for their detection. These cases showed progressive loss of vision without intraocular changes and presenting no demonstrable toxic etiology. The usual forms of therapy produced no effect upon them, but they cleared up promptly following the intravenous in-

jection of typhoid vaccine. These cases suggested a clinical entity which might be designated a chiasmal perineuritis, that may exist alone or in combination with other neurological manifestations. *M. H. Post.*

13. EYEBALL AND ORBIT

Betsch, A. **Bone formation in the lens.** Klin. M. f. Augenh., 1927, v. 79, July, p. 48.

Out of 59 phthisical globes, the author found 18 with bone formation, and 7 of these with bone in the lens. These cases are described in detail. The seven eyes with bone in the lens were enucleated from 8 to 41 years after blindness; the others from 17 to 40 years. Connective tissue grows into the degenerate partly or totally calcified lens through the opened capsule, and analogously to other secondary ossifications in the body the bone forms by metaplasia. *C. Zimmermann.*

Bollack, J., Bertillon, F., and Roques, A. **Orbital tumor of inflammatory nature.** Bull. Soc. d'Opht. de Paris, 1927, no. 4, April, pp. 192-196.

Exophthalmus had been developing slowly and progressively for five months, without signs of reaction or pain, but with evidence of pressure on the orbital sensory nerve, and on the oculomotor and optic nerves, and with extension into the lower lid. Negative Wassermanns were repeatedly obtained, and an inadequate antisyphilitic treatment failed to cause any improvement, but vigorous mixed treatment with mercury and novarsenobenzol produced a very rapid cure.

W. H. C.

Dejean, C. **The paralytic syndromes of the apex of the orbit.** Arch. d'Ophthal., 1927, v. 44, p. 657.

The literature is very thoroughly reviewed and five original case reports are given. The clinical varieties range from complete involvement of nerves II, III, IV, VI, and the first branch of V with the sympathetics, to partial involvement of the external muscles, depending upon the location of the lesion. The symptoms are unilateral ptosis, disturbances of vision, external muscle paralyses, mydriasis, exophthalmos, and loss of sensation of the skin around the eye. Any or all of them may be present. Neuroparalytic keratitis is rare, because of the protection afforded by the ptosis.

The common causes of the syndromes are syphilitic and nonsyphilitic osteoperiostitis of the sphenoid, sarcoma of the sphenoid, metastatic cancer, fractures of the base, hemorrhages and exudate in the region of the apex of the orbit, and sphenoidal sinusitis. The best prognosis is in the syphilitic type when seen early. Repeated lumbar punctures are recommended where hemorrhages are present in the orbit. Extreme pain makes one suspicious of malignancy. *M. F. Weymann.*

Dupuy-Dutemps, L. **Pulsating exophthalmus with glaucoma. Ligature of the internal carotid.** Bull. Soc. d'Opht. de Paris, 1927, no. 3, March, pp. 136-143.

After a fall on the head, a man of fifty-eight years developed pulsating exophthalmus, complicated after four months by retinal hemorrhages, and after nine months by acute glaucoma. The latter complication is mentioned in only from eight to ten percent of the cases included in Sattler's statistics. After ligature of the internal carotid, the murmur immediately disappeared, there was progressive retrogression of the exophthalmus and although the glaucomatous symptoms had lasted for four months they promptly receded, the tension returning to normal. Six weeks later the hypertension recurred, and it persisted in spite of pilocarpin (forty-five to fifty millimeters) but without pain. (Discussed by Bailliart, Terrien, and Dupuy-Dutemps.)

W. H. C.

Frogé. **Claude-Bernard-Horner syndrome, successively bilateral, and transitory.** Bull. Soc. d'Opht. de Paris, 1927, no. 5, June, pp. 204-208.

In a woman of twenty-two years, the syndrome (left enophthalmus, miosis,

and narrrowing of the palpebral aperture) had begun about the time of onset of pregnancy, but became intensified after delivery. In the later course of the disturbance there were recurrent crises of pain, shifting from one side of the cranium and face to the other. Sometimes the syndrome was bilateral but more marked on the painful side, and sometimes it was limited to the painful side. *W. H. C.*

Heesch, K. **Incipient orbital phlegmon after extirpation of tear sac.** Klin. M. f. Augenh., 1927, v. 78, March, p. 403.

The right tear sac of a man aged 31 years, who in 1918 had suppuration of the frontal sinus and soon after lost his left eye from injury, was swollen and sensitive and contained mucopus with numerous pneumococci and streptococci. During and after extirpation diffuse hemorrhages occurred, necessitating pressure bandages. The next day there was intense swelling of the lids, chemosis, exophthalmos and purulent secretion from the wound. Smears from the conjunctiva contained numerous pneumococci. By three milk injections and local application of optochin hydrochloride the affection was soon cured. Heesch thinks that, upon tearing off the tear sac from the bone, microorganisms entered the wound, this being perhaps also facilitated by the pressure bandages.

C. Zimmermann.

Grossmann, D. **Fat implantation after enucleation and evisceration.** Klin. M. f. Augenh., 1927, v. 78, June, p. 804.

Within the last six years, 195 fat implantations after enucleation were done at the clinic of Professor Elschnig. In ten the fat implant was later ejected. The operation is described in detail. Implantation after enucleation is superior to implantation after evisceration because, after shrinking of the fat, paraffin may be injected into the dense connective tissue to the desired amount. In evisceration, the formation of a hole in the posterior part of the sclera may be preferable on account of more rapid healing, but a considerable shrinking of the implantation must be reckoned with, so that the advantage is very small in comparison with enucleation. Fat is the material best adapted for cosmetic implantation.

C. Zimmermann.

Hughes, N. E. **Treatment for traumatic symblepharon.** Brit. Jour. Ophth., 1927, v. 11, July, p. 337.

To prevent union between lid and globe sometimes after such injuries silver wire of sufficient length and thickness is bent to make a continuous framework consisting of two horizontal bars connected at each end by a loop, the free ends of the wire being soldered together. One of these bars fits into the conjunctival fornix, while the other lies outside the lid, the two loops crossing over the lid.

Minor adjustments will be found necessary in individual cases to make the framework comfortable, e.g., a slight curvature with the concavity toward the globe will be necessary for comfortable fitting. The ends of the loops should be a few millimeters from each canthus. A small strip of goldbeater's skin is placed across the horizontal bar of the framework which lies in the fornix, its free border being trimmed with scissors to keep it clear of the cornea. The apparatus is removed once or twice daily for purposes of cleaning. *D. F. Harbridge.*

Koyānagi, Y. **Relationship between hereditary nystagmus and albinism.** Klin. M. f. Augenh., 1927, v. 79, July, p, 43.

Two cases of hereditary nystagmus in the same family are reported, in which there was absence of the macula with deficient pigmentation of the hair and skin. Although the eyes were not albinotic, the author considers his cases belong to this type because the albinotic eye, in the vast majority of cases, shows lack of or a rudimentary macula. Hereditary nystagmus has marked similarity to albinism of the eye in clinical signs, complications,

and heredity. If the difference between absence and deficiency is considered as gradual, it does not seem necessary, according to Koyanagi, to separate both diseases as genetically different. *C. Zimmermann.*

Saeger, F. **Orbital inflammation in early childhood.** Klin. M. f. Augenh., 1927, v. 78, May, p. 650.

After an embryologic and anatomic description of the accessory nasal sinuses, especially in childhood, and also a review of the literature, the author says that acute inflammation of the sinuses in early childhood is very frequent, but often not diagnosed, while chronic empyemas and ectasias with propagation to the orbit occur rarely. A case of very severe nasal orbital complication in a boy aged three years is related. This was cured by cleansout the inflamed and necrotic ethmoidal cells. A second case of orbital inflammation in a girl aged 19 months presented no pathologic changes in the nose. It probably started from a supramaxillary process. The sinusitis may disappear, while a secondary orbital affection may continue. In a third case a thrombophlebitis of both orbits of a girl aged nearly three years, who died from sepsis, was most likely due to purulent rhinitis which had produced an otitis media with sinus thrombosis spreading to the orbit.

C. Zimmermann.

Weekers and Gilson. **Ligature of the carotid in ocular therapeutics.** Bull. Soc. Belge d'Opht., 1927, no. 54, April, pp. 37-43.

From a case of pulsating exophthalmus in which the method described was used with distinct success, Weekers and Gilson offer the following suggestions: After ligature of the common carotid artery, the blood continues to flow into the internal carotid by way of the external carotid. Ligature of the internal carotid itself suppresses all circulation in this vessel, so that ligature of the internal carotid as the first operative step is more dangerous than ligature of the common carotid. However, ligature of the internal carotid is more efficacious. In case of need, it is therefore desirable first to tie the common carotid, and later the internal carotid. *W. H. C.*

Wright, R. E. **Two cases of granuloma invading the orbit due to an aspergillus.** Brit. Jour. of Ophth., 1927, v. 11, Nov., p. 545.

The author's first case was observed in a male aged 35 years. A large mass bulged forward from the orbit. The growth involved the sinuses, destroying the internal and superior orbital walls and occluding the nasal fossa. Sections showed granulation tissue with marked endothelial activity as a framework. After long search the unstained outline of a filament of a coarse septate mycelium in a giant cell was found. Cultures of pieces of the tissue developed fluffy eiderdown-like colonies.

The second case was in a female presenting two pea-sized elevations, one above and one below the internal tarsal ligament. Considerable destruction was present in the nasal, sphenoidal and posterior ethmoidal regions. Aspergillus was found in the giant cells.

The reporter discusses the results of intravenous inoculations, microscopic appearances, and pathogenicity of growths obtained from tube plants of the tumors. References to the literature are given. Two illustrations of the patients, seven microphotographs, and four illustrations of tube cultures accompany the contribution.

D. F. Harbridge.

14. EYELIDS AND LACRIMAL APPARATUS

Cange, A. **Complications of the lacrimal apparatus in trachoma.** Arch. d'Opht., 1927, v. 44, Aug., p. 465.

There is an atrophy of the lacrimal gland in trachoma which is of nonspecific nature and due solely to blocking of the excretory ducts by trachomatous scar tissue. The gland shows, at first, a periacinous infiltration with fatty degeneration of the secretory epi-

thelium. Later the gland appears as a small fibrous mass containing few or no secretory structures. This condition may also follow conjunctival burns or scar tissue formation of any type. Specific trachomatous dacryoadenitis has been described in the literature both as arising from a direct extension of the trachomatous process along the excretory ducts and by way of the blood stream. The histological process has been described as a periacinous infiltration of small round cells and groups of cells resembling true trachoma follicles. The process ends in an atrophy of the gland due to slow sclerosis. Some writers even affirm that the conjunctival infection is secondary to the lacrimal infection, but with the evidence presented one must assume that a true trachomatous dacryoadenitis is possible, but not indisputably established. As there are normally lymphoid follicles in the gland, a chronic inflammation might give these the appearance of a granular process. Certainly, the evidence at present does not warrant destruction of the lacrimal gland as a method of treatment in trachoma. Trachoma invades the inner canthus by the presence of follicles on the plica and also by diffuse infiltration of the caruncle. Therefore the caruncle should not be neglected in the treatment of trachoma. The canaliculi are involved secondarily in the trachomatous process, with a definite specific infection which may be either of a follicular or diffuse nature. The end result of this infection may be stenosis of the canaliculus. Obstruction of the lacrimal duct with stasis of drainage of the conjunctival sac predisposes the conjunctiva to infection with trachoma.

This article is a good review of the literature upon trachoma in relation to the lacrimal apparatus.

M. F. Weymann.

Franceschetti, A. **Diverticulum of the lacrimal sac, and retention of air in the sac.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 482.

A woman aged fifty years presented a dense cyst below the medial angle at the orbital margin, which at operation proved to be a diverticulum of the lacrimal sac. The author assumed an anatomically preformed diverticulum, and considered the slight dacryocystitis which the patient had had six months previously as the exciting cause for development of the cyst.

A man aged sixty-three years showed an elastic tumor in the region of the right lacrimal sac. Upon pressure air escaped through the lower canaliculus with a sibilant sound, and the tumor collapsed. Expiration while holding the nose, or blowing the nose, made the tumor reappear, while on closing the nose during inspiration the skin over the tumor collapsed. The left side showed the same condition. It was a case of pneumatosaccus lacrimalis, a cystic ectasia of both lacrimal sacs with abnormal caliber of the nasolacrimal ducts, probably caused by frequent blowing of the nose as a result of chronic rhinitis. *C. Zimmermann.*

Imre, Josef, Jr. **A rare anomalous position of the upper lid with resulting chronic conjunctivitis.** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 229.

The author reports three cases of displacement of the upper lid margin outward and over the lower lid on closure of the lids, with secondary hypertrophic conjunctivitis of the upper lid. The condition seems to be due to softening and expansion of the tarsus, especially near the margin, but possibly also to a congenital anomaly of the ligamentum canthi externum. The hypertrophy of the conjunctiva of the upper lid was caused by mechanical irritation from rubbing by the lashes of the lower lid. In each case operation according to Kuhnt-Symanowsky cured the affection.

C. Zimmermann.

Isakowitz, J. **A rare hereditary anomaly of the palpebral fissure** (atypical coloboma of the lower lid?) Klin. M. f. Augenh., 1927, v. 78, April, p. 509. (2 ill.)

Each lower lid of a woman aged sixty-two years consisted of two parts,

a small vertical and a larger one extending from downward and outward to upward and inward. After light closure of the lids and during sleep a small triangular fissure remained with its apex toward the nasal angle. The father and a sister had the same anomaly, which the author considers as atypical coloboma.

C. Zimmermann.

Jost, Albert. **Operations upon the lacrimal sac with regional ischemia.** Arch d'Opht., 1927, Aug., v. 44, p. 506.

Regional anesthesia of the sac by blocking the external nasal and infraorbital nerves has been satisfactory except for the hemorrhage encountered. Infiltration anesthesia controls the hemorrhage but distorts the tissues. The blood supply of the sac is discussed and a method of blocking both the nerves and the blood supply by making three injections of novocain and adrenalin is described. Each injection used is 1.5 c. c. of novocain containing 2 m. adrenalin. The first puncture is over the external nasal nerve, the second over the infraorbital nerve, and the third extends from the infraorbital foramen to the superior portion of the ala of the nose with the needle passing well into the subcutaneous tissue.

M. F. Weymann.

Kleefeld. **Median blephorrhaphy.** Bull. Soc. Belge d'Opht., 1927, no. 54, April, pp. 49-52.

The author has had experience of a number of cases of keratitis resulting from injection of alcohol into the Gasserian ganglion. He finds that the usual method of median suture of the eyelids does not last long enough to take care of these cases. He therefore slits the eyelid by an intermarginal section a centimeter long and extending the height of the tarsus. By scissor cuts perpendicular to the marginal section, he releases on each eyelid a strip of skin, and he then sews the two strips together with their raw surfaces in contact. The threads are entirely external and do not touch the cornea, and the lids can be released at any time by cutting between the double row of eyelashes.

W. H. C.

Madan, K. E. **Senile blepharospasm.** Brit. Jour. Ophth., 1927, v. 11, Aug., p. 385.

This is the case record of a man aged 56 years, who five years previous to observation had had a cataract operation. The fellow eye was blind. Vision in the operated eye had failed and he had developed a clonic blepharospasm. The skin of the lower lid and of the infraorbital region was very baggy and lax. There was a dense central pupillary capsular membrane. A central hole made in the tough capsule greatly improved vision. After experimentally making the lax skin taut with horizontal strips of adhesive, a more permanent effect was obtained by removing an oval piece of skin 1 by 1-1/2 inches over the malar prominence and stitching the edges together. The patient gradually improved and was almost cured. The removal of the mental anxiety as to impending blindness, improvement of sight, and disappearance of irregular rays of light due to removal of the dense capsule and improvement of the lid tone, due to obliteration of the loose baggy skin, seem to have been the factors which afforded relief.

D. F. Harbridge.

Vancea, P. **Vegetative syphilitic tarsitis.** Arch. d'Opht., 1927, Oct., v. 44, p. 644.

Syphilitic tarsitis is a rare affection with a description in three clinical types; the infiltrating type, the nodular type, and the marginal type. The writer reports a different type which he has named vegetative syphilitic tarsitis. This was characterised by a small, rose-colored, painless, and slightly pedunculated tumor, arising from the superior left tarsus, which might resemble a meibomian epithelioma. The preauricular gland was enlarged, the Wassermann strongly posi-

tive, and the tumor disappeared in less than a month under antisyphilitic treatment. *M. F. Weymann.*

15. TUMORS

Archangelsky, W. N. **Metastatic disseminated carcinoma of the choroid.** Klin. M. f. Augenh., 1927, v. 78, April, p. 534. (8 ill.)

A man aged thirty-two years affected with lymphadenitis of the neck, complained for ten days of visual disturbance in the left eye. At the macular region a light yellow tumor of the choroid protruded three millimeters into the vitreous. Its surface was smooth. The vessels coursing over it showed no anomalies, and no detachment of the retina was noticeable. The tumor grew rapidly and covered the temporal margin of the optic disc. Death occurred after twenty days. The autopsy revealed carcinoma of the left bronchus with extensions into the left lung, metastasis in right lung, liver, kidney, spleen, suprarenal capsules, ribs and many lymphatic glands. The alveolar carcinoma of the eye started from the choroid near the disc and spread through its whole thickness to the equator and from the suprachoroidea to the elastic lamina. Special features were growth of the tumor in the blood vessels, embolisms of carcinoma cells in the whole choriocapillaris and in the veins of the sclera near and in the canal of Schlemm. Apparently it had entered through the short posterior ciliary arteries into the choroid, and by penetrating into the small vessels had caused embolism and stasis, whereby the cells in the vessels could grow down stream without being flushed out by the blood current.

C. Zimmermann.

Benedict, W. L. **Glioma of the retina (retinoblastoma).** Proceedings of staff meetings of the Mayo Clinic, 1927, v. 2, p. 265.

Twin girls were brought for tumors in the left eye of each. In one this mass had perforated the globe and invaded the optic nerve; and she died five months later of intracranial extension. In the other twin, the enucleated eye showed no extension of the growth, but the right eye showed a tumor in the inferior temporal quadrant. Radium treatment of 6,000 milligram hours was given, and repeated at intervals until 90,000 mg. hours had been given. There was no extension of the tumor after the first treatment, but gradual shrinkage. At the end of five years, she had carried on school work to the fourth grade, and the tumor had disappeared. There were vitreous opacities and lens opacities, believed to be due to choroidal disease from degeneration and absorption of the tumor. Beyond the scar occupying the original region of the tumor, the choroid and retina appeared normal. Vision was 6/60. The author considered that the growth had been cured by the use of radium. *E. J.*

Carrère, L. **Epibulbar nevocarcinoma.** Bull. Soc. d'Opht. de Paris, 1927, no. 6, July, pp. 272-279.

In a woman of sixty-eight years, a white conjunctival nevus near the limbus was for a long time quiescent, but after secondary pigmentation it underwent rapid growth with invasion of the cornea. Histologic details of the enucleated eyeball are given. There was complete disappearance of the mucous cells of the conjunctival epithelium, the tumor elements had an epithelial character, and there was no metaplasia, a fact often noted in nevocarcinomata. The author agrees with Veil that these tumors are to be regarded as benign only as long as they do not take on pigmentation.

W. H. C.

Cords, R., and Eigel, W. **Strumous metastases in the eye.** Graefe's Arch., 1927, v. 118, p. 478.

It is now known that metastatic tumors can arise from the thyroid gland. Only cases with metastases from benign thyroid adenomatous tissue containing no cancer cells are here included. There have been but thir-

teen such cases reported; most frequently affected were the bones, the liver, the heart, the skin and the choroidal plexus.

The authors report the first case of intrabulbar noncancerous metastasis from the thyroid. A young woman of thirty years had in 1922 a tumor in the neck the size of a hen's egg. Two years later a tumor was observed on the right side of the forehead; under this growth the bone was perforated and at its margin there had been thrown up a wall-like elevation. Microscopic examination of the growth from the forehead showed the structure of struma parenchymatosa colloides, typical of a metastatic adenomatous struma.

Seven months later the tumor in the neck was removed and microscopic sections proved it to be a rapidly growing colloidal struma. During the next year growths occurred in the right nasolabial fold, the left buttock, and the left arm, and upon the sternum. The growth from the buttock showed under the microscope a tendency to larger epithelial nests, or the character of a malignant struma.

On May 31, 1926, at the first examination of the eye, vision in the right eye was 5/20 with plus 3.00 D. sph.; vision in the left eye was ability to count fingers close to the eye. The field for the right eye showed temporal contraction to ten degrees and that for the left eye nasal contraction to the point of fixation. In each eye there was a large white tumor swelling forward from the left side of the fundus. The general condition grew gradually worse. On July 27, 1926, vision in the right eye was light perception and in the left eye was nothing, due to the gradual increase in size of the intraocular tumors. Death occurred July 30, 1926.

Postmortem examination showed many more metastases than were observed clinically; several small nodules were present under the skin in the region of the operative scar, in many places under the skin of the breast and stomach, on the ribs, third lumbar vertebra, the right pubic arch, on the pelvis and on the acetabulum. The sternum was completely infiltrated with soft tumor masses which had invaded the anterior mediastinum. A tumor mass was present in the psoas muscle, in the anterior papillary muscle of the mitral valve of the heart; many tumor nodules were present in the lungs, kidneys, adrenals, and liver. On the top of the skull were several tumor masses which had completely destroyed the bone. A tumor mass was present in the dura on the ethmoid, one on the sphenoid, and another appeared on the sella turcica, filling the cavernous sinus.

Microscopic examination of all these metastatic nodules showed them to be composed of small regular follicles of thyroid tissue filled with colloid material. In each eyeball, the retina was completely detached by the tumor mass in the choroid. The microscopic structure of the ocular growths was the same as that of the other metastases. In the left eye, the amount of epithelium was proportionately greater than that of colloid.

Conclusion: Although these tumors of the thyroid form metastases, the primary tumor as a rule shows no local sign of malignancy. *H. D. Lamb.*

Davenport, R. C. **A family history of choroidal sarcoma.** Brit. Journal of Ophth., 1927, v. 11, Sept., p. 443.

The author adds two case reports of sisters to a previous record of two generations of the same family previously reported by Parsons from Moorfields' records. There were five definite cases, all in females, in three generations. The average age was 28.6 years. *D. F. Harbridge.*

Davenport, R. C. **Some notes on sarcoma of the uveal tract.** Brit. Jour. of Ophth. 1927, v. 11, Dec., p. 609.

This is a report on thirty-five cases at Moorfields during the years 1918 to 1923. Added to previously reported cases, the author finds records of three hundred and forty-five during a period of fifty-five years. This averages six

per year. In the series studied there were exactly seven per year or about two per ten thousand patients. One third were in males; average age 50.4 years; no preference as to the eye affected; tension raised in sixteen cases, eighteen normal. Various types were found. Twenty-two patients were traceable; ten were found to be alive from three and a half to eight years following operation. Of those dead, none showed recurrence in the orbit.

Some unusual features were: One case was discovered during routine examination. One showed pigmentary macular changes six years previously, one a pigmented area in the sclera over the ciliary region observed some years previously, one was metastatic from the breast and abdomen and a fifth case was in a family with history of choroidal sarcoma. *D. F. Harbridge.*

Puscariu, Ellena. **A case of dermo-lipo-chondro-adenoma.** Brit. Jour Ophth. 1927, v. 11, no. 10, Oct., p. 481.

The case described was first observed at the age of six weeks. The right half of the right eyeball and cornea was covered by a pinkish tumor. The right side of the head and nose was covered with what looked like a nevus. The tumor was removed. Five years later there was a recurrence, and also a tumor on the left eye. Three illustrations and one microscopic drawing are given.

D. F. Harbridge.

Drak, Jules. **A case of endothelioma of the semilunar fold of the conjunctiva.** Arch. d'Opht., 1927, v. 44, Nov., p. 704.

The literature was reviewed and attention called to the rarity of endothelioma of the conjunctiva. No case arising from the plica has ever before been reported. This one occurred in a twenty-nine year old girl as a translucent, hard, vascular, and flat tumor adherent to the plica. The sclera was not involved and the nodule was easily dissected free. Microscopic examination showed a typical endothelioma of a benign nature. It was thought that the origin was probably an embryonic rest. *M. F. Weymann.*

Halbertsma, K. T. A., and Pieck, C. F. M. **Primary peripapillary sarcoma of the choroid.** Klin. M. f. Augenh., 1927, v. 78, April, p. 516. (4 ill.)

A primary peripapillary sarcoma of the choroid of the right eye of a man aged forty-one years was observed at a very early stage, before it protruded into the surroundings. Gullstrand's ophthalmoscope showed about five nodules which pushed the retina forward. There was a corresponding scotoma of the upper temporal quadrant two degrees from the fixation point. The peripapillary location is very rare. The enucleated eye showed a spindle-cell sarcoma. *C. Zimmermann.*

Stock, W. **Bilateral metastatic hypernephroma of the uvea.** Klin. M. f. Augenh., 1927, v. 78, Supplement, p. 116. (2 ill.)

A woman aged forty-three complained of her eyes for the first time nine months before her death. The trouble was due to cyclitis and opacities of the vitreous. After six months there was detachment of the retina in both eyes. A tumor was suspected, but transillumination was negative. The patient developed mental disorders and died in an epileptic attack. The right kidney was replaced by a round-celled sarcoma, as was also the left half of the thyroid. The choroid of both eyes was thickened to four times its size by large tumor cells in nearly all the vessels, and by lymphocytes. Transillumination was negative on account of lack of pigment in the tumor. This had undoubtedly started from a sarcoma of the suprarenal gland. Perhaps repeated examinations of the blood would have revealed tumor cells. *C. Zimmermann.*

Terrien, F., Mawas, J., and Veil. **Atypical forms of Recklinghausen's disease, palpebro-orbital neuro-gliomatosis.** Arch. d'Opht., 1927, v. 44, Nov. p. 691.

Original case reports of two patients affected with neurogliomatosis of the lids and orbit are given. In both patients the lid condition was noticed at the age of two years but there were congenital pigment spots on the body. There were no other tumors except those on the lids. Neither x-ray nor radium had any effect; but in one case, after five surgical interventions, there was a marked improvement. Surgery is not without great risk because of the number of fatal hemorrhages reported. It is believed that the condition is rather frequent and is often unrecognized. There was a diffuse thickening of the upper lid with extension of the tumor mass back into the orbit. The microscopic picture showed diffuse hypertrophy of the nerve fibers with marked vascularity.

M. F. Weymann.

16. INJURIES

Beauvieux. **Immediate prognosis and early treatment of wounds of the sclerotic from glass.** Arch. d'Opht., 1927, v. 44, Sept., p. 529.

The immediate prognosis of scleral or corneoscleral wounds by glass depends upon the following factors: first, the site of the injury; second, its extent and form; third, its state of asepsis; and fourth, the presence or absence of a fragment of glass in the globe. In order to discover if a fragment is present one must use ophthalmoscopic examination, transillumination, the slit lamp, and the x-ray. In the experience of the writer, when properly handled, the x-ray has given valuable information. Different positions with rays of varying intensity will always show the fragment, especially if it contains much lead. In clean wounds, even with marked loss of vitreous, a good result is often obtained by suturing and covering with a conjunctival flap. If a fragment is in the globe it is better to leave it there unless it can be removed without much instrumentation. The eye is very tolerant of the presence of glass. Expectant treatment is often advisable.

M. F. Weymann.

Hall, A. J., and Marshall, J. **Pathological effects of penetrating wounds of eyeball.** Med. Jour. Australia, 1927, Supplement, Dec. 3.

Study of 35 cases from the Glasgow Eye Infirmary shows that infection following such wounds may produce panophthalmitis, vitreous abscess, posterior endophthalmitis, anterior endophthalmitis, plastic iridocyclitis, and proliferative fibrosis, arising from the cut tissues at the wound. In very acute types, violent pain and intense inflammation of the whole eyeball develop in a few hours, with early chemosis, muddy or yellow iris, and yellow reflex from the pupil. Vitreous abscess stands between frankly purulent panophthalmitis and plastic iridocyclitis. The attack is less violent and after a few days shows signs of improvement, but the globe remains irritable and gradually goes on to shrinking, even when the initial signs were mild. The greatest inflammatory reaction was in the ciliary body, and purulent exudate is thrown out into the vitreous. Where infection of a posterior wound extends forward, the cases are difficult ones in which to form a prognosis. Tests of perception of light and reaction of pupil to light should be carried out. Septic, plastic iridocyclitis is difficult to separate from the previous cases. The vitreous exudate is less dense, made up of round cells and fibrin, and is plastic. In the last group there is a purely localized reaction, and proliferation in the wound. Wounds of ciliary body, sclera, and cornea may have this result. These pathological changes are illustrated by photographs of sections of fourteen eyeballs. *E. J.*

Jourdan, Henri. **Defects from experimental compression of the cornea.** Ann., d'Ocul., 1927, v. 164, Nov., pp. 855-861.

The author has made compression of from 250 grams to 600 grams at the equator of rabbits' eyes and has studied histologically these eyes. The principal variations with the different degrees of pressure were increasing epithelial detachments and edema of the

base of the iris and ciliary body with the increasing pressure. *L. T. P.*

Roggenbau, Christel, and Wetthauer, August. **Permeability of refracting media of the eyes of cattle for light of long wave lengths.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 456. (5 ill.)

The experiments are described in detail, with the conclusion that it is not the visible rays which penetrate most to the retina, but the invisible, namely, the short-wave ultrared rays. The quantity of these is seven times as great as that of the ultraviolet rays. The lens absorbs most rays between 1,000μμ and 1,200μμ.

C. Zimmermann.

Safar, Karl. **A specific linear ring on the iris following injury to the eyeball.** Graefe's Arch., 1927, v. 118, p. 518.

In two of the author's cases, after severe injury from flying particles of glass, there occurred a thin reddish-brown curved line in the iris. By close examination, a dark furrow was made out in the middle of the line and a bright yellow streak bordered the line externally on each side. The author thinks this condition is probably analagous to the partial sinking in of the iris observed in enucleated eyes after injury and reported by A. Fuchs (American Jour. of Ophthal., 1925, vol. 8). *H. D. Lamb.*

Steindorff, K. **Argyrosis of cornea in industrial diseases.** Klin. M. f. Augenh., 1927, v. 78, Jan., p. 51.

A man aged eighty years, who for fifty years had worked in a factory for silver "filling" of metals by galvanizing process, presented ocular argyrosis. There was a brownish black staining in the vicinity of the semilunar fold. The cornea appeared uniformly slightly grey, the grey color appearing under the Zeiss loupe as dots of silvery luster in the deeper layers as far as Descemet's membrane. The posterior surface seemed opaque, but the fundus was clearly visible. That the silver particles were especially accumulated near Descemet's membrane is in accordance with the fact that in argyrosis elastic tissue is intensely colored by silver.

Argyrosis can be explained mechanically by dispersion of insoluble metallic silver in finest suspension through the blood and sedimentation in certain tissues. Or we may assume that the silver particles conveyed into the stomach are converted into silver chloride, and that in the presence of albumin this is transformed into silver albuminates which are dissolved in the digestive juices, conveyed by the blood current, and partly reduced in the intestines, liver, kidney, and skin.

C. Zimmermann.

17. SYSTEMIC DISEASES, INCLUDING PARASITES

Adler, Francis Heed. **Ocular disorders in deficiency diseases.** Arch. of Ophth., 1927, v. 56, Nov., p. 593.

This paper is an attempt to present the results of experimental and clinical study of deficiency diseases, only as they affect the structure and function of the eye. Three conditions are dealt with.

Xerophthalmia: In 1913 Osborne and Mendel demonstrated that xerophthalmia could be produced in rats by a diet deficient in fat soluble A vitamin, and could be cured by adding butter fat or cod liver oil to the diet. Since then, the occurrence of xerophthalmia in rats has come to be regarded as a criterion for the adequacy or inadequacy of vitamin A in the diet. This conclusion, however, has not remained unchallenged. In 1922, McCollum, Simmonds, and Becker demonstrated a type of ophthalmia in rats which occurred in the presence of a diet rich in vitamin A. They concluded that it must be the result of improper salt mixture. Other observers have had similar results. It has been found that rats fed on such a deficiency diet, if exposed to direct sunlight, were very slow to contract the disease, and where they did so it took a mild recurrent form. Morey believed that changes in

the cornea were due directly to the drying of the eye by a resultant cornification of the epithelium. His experiments, however, could not be confirmed by Yudkin and Lambert. Wolbach and Howe found, on the other hand, that specific tissue changes which followed deprivation of fat soluble vitamin A concerned epithelial tissues, stratified keratonising epithelium taking the place of normal epithelium in various parts of the respiratory tract, alimentary tract, the eyes, periocular glands, and genitourinary tract.

The disease occurs in man as local plaques of a white material resembling soap suds, the so-called Bitot's spots on the conjunctiva. These are followed by clouding and softening of the cornea, with ulceration and loss of the eye. Acute purulent forms are seldom seen. It occurs chiefly in the young, during the period of most rapid growth, and has been noted where the diet was poor in the fat soluble vitamin A; as, for instance, where margarine has been substituted for butter.

Cataract: Cataracts have not been satisfactorily demonstrated as produced by deficiency of vitamin A, though there are isolated experiments that would indicate such a result.

Night blindness: This condition is a symptom of various diseases of the retina. Parsons terms it "some defect in the function of the rods and visual purple." Experiment showed that regeneration of the visual purple in rats' eyes was much slowed in those fed on a diet poor in vitamin A. It occurs with and without xerosis and xerophthalmia. The treatment consists in supplying the fat soluble vitamin A. Hift observed that night blindness occurring during the war cleared rapidly after the addition of liver or cod liver oil to the diet. *M. H. Post.*

Allan, Wm. **The neuropathic taint in migraine.** Arch. Neurol, and Psychiat., 1927, v. 18, Oct., pp. 587-590.

The author reaches the following conclusions:

1. Psychoses, psychoneuroses, and epilepsy occur with the same frequency in migrainous as in nonmigrainous persons.

2. Migraine has not been observed to come from anything but migraine in the parents, nor to pass down to the children in any form. More than ninety percent of the author's migrainous patients gave a history of migraine in one or both parents. With one parent migrainous, half the children were found migrainous; with both parents migrainous, more than three fourths of the children were found migrainous.

3. Migraine seems to be a condition entirely independent of the neuropathies here mentioned, and its inheritance seems to be as free of neuropathic taint as the inheritance of color of the eyes. *W. H. C.*

Back, H. **Relations of chronic septic conditions of the teeth to diseases of the eye.** Klin. M. f. Augenh., 1927, v. 78, March, p. 316.

While on the continent of Europe lues and tuberculosis are given the greatest importance in the etiology of chronic uveitis, in England and America focal infection and oral sepsis are regarded as the predominant factors. The conclusions reached by Back from experiments are that the streptococci regularly found in granulomas of the teeth are not pathogenic for mice and show no elective effect from the blood current upon the eyes of rabbits. If brought to the tissues of the eye their effect differs from that of the common agents of suppuration.

Back's clinical investigations proved that in various eye diseases affections of the teeth were very frequently present. Only in four out of fifty cases of iridocyclitis of unknown etiology were the teeth negative. Positive dental findings in unilateral iridocyclitis were more frequent on the same side. In seven cases of retrobulbar neuritis severe changes in the teeth were found, and in two of them removal immediately improved the impaired vision. Possibly the unknown virus of multiple sclerosis, or the causative factor of retrobulbar neuritis, may reside in api-

cal granulomas. Back demonstrated the virus of herpes in the carious dental cavities of patients with herpes corneae, and also produced infection of the corneas of rabbits with herpes from the perfectly closed granulomas of such patients. It appears possible that the herpes virus may be propagated from these granulomas by the nerve paths toward the center, and hence through the branches of the fifth nerve to the eye. The importance of reflex irritations from the teeth is emphasized. A second possibility is that toxins are produced in the teeth, as shown by increase of indican in the blood and urine. For direct metastasis there was no proof, as Back's experiments did not confirm the elective localization of intravenously injected streptococci.

C. Zimmermann.

Brown, M. E. **Ocular manifestations of disease of the paranasal sinuses.** Radiology, 1927, Nov.

In these cases the ophthalmologist should study: Color perception, central and peripheral; color acuity, central; visual acuity, central; campimetric measurements of the blind spot; peripheral field studies of form and colors; refractive errors; derangements of binocular vision; scotoma with the tangent screen; and radiographs. Involvements of the different sinuses are taken up separately, including frontal, ethmoid, the antrums, and acute, chronic, and hyperplastic sphenoiditis. The paper is illustrated with radiographs and charts of visual fields. The latter show, generally, irregular concentric contraction, with sometimes enlarged blind spot. Some charts are given showing enlargement of the fields after operative intervention.

E. J.

Carpenter, E. R. **The importance of ophthalmology and otology in the early diagnosis of tumors of the brain.** Arch. of Otolaryng., 1927, v. 6, Oct. pp. 366-372.

In general, the diagnosis of tumor of the brain is made too late to be of material benefit to the patient. Headache is the predominating early symptom. By proper investigation of chronic recurring headache, when there is a history of definite onset, many tumors can be detected before late symptoms develop. Since ophthalmologists and otologists see many patients with symptoms of tumor of the brain in the early stages of development, they have exceptional opportunity to cooperate in making a diagnosis of these lesions at comparatively early stages.

W. H. C.

Guillery, H. **Formation of tumors by remote action of tubercle bacillus.** Deut. Med. Woch., 1927, April, p. 740.

Guillery introduced into the vitreous of rabbits particles of a glycerin potato culture of tubercle bacilli from human empyema enclosed in a capsule. On the twenty-second day the operative scar was intensely infiltrated in the shape of a flat ridge which developed into a tumor producing exophthalmos. Upon killing the animal three months after operation the tumor covered the upper and posterior portions of the eyeball. It consisted mainly of epithelioid cells, with foci of lymphocytes and a few giant cells. The interior of the eyeball was for the most part filled with similar masses. The origin of these exuberances was the choroid. The autopsy disclosed no signs of tuberculosis or any other disease of the internal organs. The author feels that his experiments prove that extensive tumors of tuberculoid structure may arise from the remote action of tubercle bacilli, the membrane letting through only the virus of the tubercle bacilli and not the bacilli.

C. Zimmermann.

Haden, R. L., Rosenow, E. C., Lyman, H. W., and Tivnen, R. J. **Symposium on focal infection.** Trans. Amer. Acad. of Ophth. and Otolaryng., 1927, p. 35.

Haden, speaking of etiology and medical aspects, emphasizes these points: The first requisite in the management of focal infection is a sane general survey of the patient, keeping

in mind the possibility that the symptoms often ascribed to focal infection may be due to entirely different causes. In the vast majority of cases the foci are found in the teeth, tonsils, and sinuses. In determining the disposition of foci, factors influencing the resistance of the individual must be evaluated, and the structural damage already done must be considered. Very often the systemic disease is dependent upon continuous damage over a long period of time. Eradicating the foci may avail little. Where the removal of foci is indicated, all possible foci must be removed. The experimental and clinical study of focal infection emphasizes the important relation of foci to systemic disease, and the need for the early recognition and removal of foci before systemic disease has resulted. The systemic disease should be cured before it begins.

Rosenow took elective localization in the pathogenesis of diseases of the eye. Intravenous injection of cultures of materials from foci of infection has led to a better understanding of how these, often small and in obscure places, cause ocular manifestations; and the causative organisms have frequently been isolated. The successful applications of the methods of study, while simple, require unusual facility of cooperation between bacteriologist and clinician. Lesions in the eye which are associated with exudation are usually due to actual localization of microorganisms, while the milder manifestations may sometimes be due to absorption of toxins. Animal experiments indicate clearly that localization and growth in most instances are due to peculiar acquired or inherent properties within the bacteria themselves, and to their power to localize electively. Among the microorganisms isolated which manifested the greatest elective localizing power, and with which the common forms of diseases of the eye have been reproduced, is a streptococcus which usually produces greenish or slightly hemolytic colonies on blood agar, which requires a reduced oxygen tension for its isolation, and from which in many cases autogenous therapeutic vaccines of great value have been prepared.

Considering the otolaryngologic phase, Lyman concludes: Focal infections are frequently the cause of general diseases. A large proportion of these foci are found in the ear, nose, and throat. The fact that multiple infections may exist must be borne in mind, and all possible foci considered. Finally the writer again wishes to emphasize the statement that this problem does not consist merely in the discovery and elimination of an offending focus, but is one which requires the most careful study of the case from every angle, and the closest co-operation between the various consultants. While this general care and observation is essential in these cases, the prime importance of discovering and correcting any focus of infection remains, and we can safely state our belief that no patient is made worse by the elimination of foci of infection in the ear, nose, and throat.

Tivnen reviews the literature bearing on the general aspects of the subject, and takes up the clinical manifestations, iritis, phlyctenular conjunctivitis, optic neuritis and atrophy, choked disc, corneal ulcer, recurring retinal hemorrhages, and traumatic, postoperative and endogenous infection. He concludes: Focal infection, as an etiologic factor in ocular pathology, is an accepted scientific fact, established and supported by clinical experience and experimental research. Many sources of focal infection as factors in ocular lesions are recorded. The preponderance of case reports referred to the teeth, the tonsils, the nasal accessory sinuses, the deep urethra, and the prostate.

A survey of the subject points to the wisdom of cooperation on the part of the internist, the neurologist, the oral specialist, the laboratory worker, the roentgenologist, the otolaryngologist, and the ophthalmologist, in an investigation of obscure lesions of the eye. The doctrine of focal infection promises much as an explanation of many obscure ocular lesions. But it is wise to preserve an open mind and

a balanced judgment. A review of the literature impresses one as to the wisdom of subjecting patients afflicted with ocular trauma, who are not exhibiting satisfactory progress, to a thorough investigation, designed to establish the possible influence of a latent focal infection on the clinical progress of the case. It would seem also the part of prudence and good surgical judgment, insofar as is practicable and without inflicting ill-advised hardship, to eliminate all sources of focal infection before subjecting a patient to a serious ophthalmic operation. *E. J.*

Hartmann, K. **Extraction of living larva of fly from anterior chamber.** Klin. M. f. Augenh., 1927, v. 78, Feb., p. 233.

Hartmann extracted from the lower angle of the anterior chamber of the left eye of a boy, aged five years, a living larva of a fly (Hypoderma bovis) which had caused iridocyclitis, displacement of the lens and opacities of the vitreous. Apparently a fly had deposited on the lid border or the conjunctiva an egg from which a larva developed. Four millimeters from the limbus was a scar from the perforation through which the larva had entered the anterior chamber, living there for over three months. Vision 1/5. This is the seventh case of ophthalmomyiasis in the anterior chamber reported in the literature and the first observed in Germany.

C. Zimmermann.

Keifer, H. A., and Shulman, L. **Tuberculosis of the eye and the use of tuberculin.** Trans. of Section on Ophth. Amer. Med. Assoc., 1927, p. 128.

"Tuberculosis of the eye is a far more common affliction than is generally recognized." . . . . "Perhaps nearly one-third of all nontraumatic inflammations of the uveal tract are tuberculous." Opening with statements like these, this article may help put an end to the idea that tuberculosis does not attack the eye.

The details of seventeen cases reported here support and illustrate the conclusions of the authors. Infection may be by lodgment of the bacilli on the conjunctiva, distribution by the blood stream or through the lymphatics, direct extension from neighboring parts or by trauma. The lesions involve the lids, conjunctiva, cornea, sclera, iris and ciliary body, lens and vitreous, retina and optic nerve, orbit and lacrimal apparatus.

The diagnosis is made by the clinical examination, and by the Detre differential cutaneous test, with daily examinations for four days. Using von Ruck's vaccine for treatment, the initial dose may be as small as one-millionth of a milligram. The injections, repeated on an average once a week, may reach a maximum of three mg., or may only go as high as 0.001 mg. When all symptoms had disappeared or become stationary, treatment was discontinued. This might be three to eighteen months.

The conclusions reached are: A large percentage of cases of ocular tuberculosis are not diagnosed as such. A very careful physical examination should be made in all questionable cases. Tuberculin furnishes one of the most valuable aids at hand in the diagnosis of ocular tuberculosis. Tuberculin is one of the most effective of all agents at our command in combating ocular tuberculosis. The oculist will obtain better results by placing his tuberculous eye cases in the hands of a tuberculist, for the administration of tuberculin, than by attempting the use of this powerful agent himself. Uniformly better results are obtained in the diagnosis and treatment of ocular tuberculosis when tuberculin is used in conjunction with other treatment than when it is neglected. The type of case suited for tuberculin therapy, the dosage, and other details must be carefully ascertained in each individual patient if satisfactory results are to be expected.

The cases reported included keratitis, choroiditis, iritis, hyalitis, uveitis, iridocyclitis, glaucoma, choroiretinitis,

conjunctivoscleral abscess. In the discussion, printed with the paper, the frequency and wide variety of lesions due to tuberculosis were emphasized by Holloway and Derby, and the long period over which such cases must be watched to get an adequate idea of the clinical course. The danger of the large doses, and the extreme minuteness of the best individual dose for some cases, were pointed out by Rose. *E. J.*

Villard, H. **Ocular complications of mumps.** Arch d'Opht., 1927, v. 44, Aug., p. 492.

Inflammation of the lacrimal gland is the least rare complication of mumps. It is always bilateral and of two types; the mild type known as "weeping mumps" which may pass almost unperceived, and the second type which is more frequent, characterized by acute and nonsuppurative dacryoadenitis and often associated with orchitis. The prognosis is good. The treatment consists of frequent hot wet compresses.

A new case of dacryocystitis thought to be due to an ascending infection from purulent rhinitis during the course of mumps is reported by the author. Acute conjunctivitis without mucous or purulent discharge has been described. This may be only an attenuated form of dacryoadenitis. Other cases previously reported by the author and in the literature which he reviews include severe keratitis, paralysis of accommodation, iridocyclitis, albuminuric retinitis, retrobulbar neuritis, and neuroretinitis. *M. F. Weymann.*

Wilmer, W. H. **Clinical aspects of ocular tuberculosis.** Arch. of Ophth., 1928, v. 57, p. 1.

In this very interesting paper, the author has gone carefully into the details of diagnosis and treatment of ocular tuberculosis. He comes to the conclusion that tuberculosis is an important etiological factor in resistant lesions of the eye, and that these lesions, where unaccompanied by other tuberculous foci, may be due to a strain of bacilli that are less virulent than those producing constitutional disturbances.

He favors the intradermal diagnostic use of O T, beginning with a dose of 1/10,000 mgm., followed by 1/1,000, then 1/100, except in the case of lesions of the most delicate nature, such as hemorrhagic chorioretinitis, etc. He believes that the therapeutic use of tuberculin is valuable, and in practice begins with 1/1,000,000 mgm., gradually increasing the dose. During such treatments the eye should be under the constant observation of a competent ophthalmologist and in addition all efforts should be made to build up the physical and mental health of the patient. *M. H. Post.*

D. J. Wood. **Calcium deficiency in the blood with reference to spring catarrh and malignant myopia.** Brit. Jour. Ophth., 1927, v. 11, May, p. 224.

This investigator discusses his observation of blood calcium deficiency in spring catarrh, conical cornea, and malignant myopia. In spring catarrh all cases showed a definite deficiency compared with the normal of 11 mg. per 100 c.c. of blood. Afenil was used in the earlier cases with the result that in the pericorneal type the thickening disappeared within three weeks. Lid types took longer. Later he combined the calcium administration with parathyroid extract. These conditions usually present themselves at a time in life when there is a great demand for lime salts by the bones of the body. Underlying this, there is an endocrine imbalance, possibly between the ovaries and parathyroids. The former permits release, the latter tends toward retention of calcium in the blood. The author associates lack of lime salts with certain types of conical cornea. He cites one case in which calcium registered 7.5 mg. In relation to malignant myopia, the author discusses eight typical cases, the calcium content ranging from 7.5 to 9.5 mg. The method of quantitative estimation of calcium content of the blood is given. *D. F. Harbridge.*

18. HYGIENE, SOCIOLOGY, EDUCATION AND HISTORY

Best, F. **Automobile drivers with one eye.** Klin. M. f. Augenh., 1927, v. 79, Oct., p. 514.

Best discusses this subject with reference to governmental regulations with the conclusion that possession of only one eye does not demand exclusion from driving an automobile.

C. Zimmermann.

Ginestous, E. **Early reeducation of the blind.** Jour. de Méd. de Bordeaux, 1927, Dec. 10, p. 891.

The importance of the cooperation of the oculist for the help of the blind, pointed out by Prof. Truc, needs to be emphasized. The reeducation should begin as soon as possible, even with those not yet blind but threatened with early blindness; both to take advantage of the greater facility for learning that belongs to youth, and to prevent or diminish the depression that blindness brings to all who know nothing of the things that the blind can do.

The special training can begin with reading and writing. The knowledge of Braille can be obtained in twenty or thirty days, and in four cases given the patient could read fluently in two or three months. Painting may be impossible to the blind man; but Vidal, the celebrated sculptor of animal pieces, became blind at 22 years, and music has been mastered by many blind artists. Modelling, weaving, and brush-making open remunerative occupations to the blind; and recently horticulture and poultry raising have proven practical and attractive additions to the list of such occupations.

E. J.

Gutsch. **Should a chauffeur's license be given to a person with one eye aphakic?** Klin. M. f. Augenh., 1927, v. 79, Aug., p. 255.

The German government has decreed that the license may be given to a person with only one eye, or with one eye aphakic, if the vision of the other eye without a lens is two-thirds and there are no other disorders.

C. Zimmermann.

MacCallan, A. F. **The History of ophthalmology in Egypt.** Brit. Jour. of Ophth., 1927, v. 11, Dec., p. 602.

This contribution, as a preface, refers to the development of ophthalmology as shown in early Arabic literature. The major portion the author devotes more particularly to the development and advance in Egypt during the nineteenth century. The century is divided approximately into periods of twenty-five years. Reference is made to early military ophthalmia being probably a mixture of trachoma, blennorrhea, and the more harmless infections such as from Koch-Weeks bacillus. Clot Bey, a chief surgeon of the army, did much in establishing hospitals and providing means for the care of the suffering and blind. Pieringer proved the identity of urethral and ocular gonorrhea. Anagnostakis devised a satisfactory method of correcting ectropion resulting from trachoma. Tachau first introduced modern operations for cataract and glaucoma. Robert Koch, visiting Alexandria, beside discovering the comma bacillus in cholera, also isolated the Koch-Weeks bacillus.

Fuchs made at intervals several visits to Egypt. From 1900 up to the present time very definite advances have been made as to the greater number of ophthalmic surgeons, more hospital facilities and the adoption of hygienic methods of treatment. During this period amelioration of blindness has been marked.

D. F. Harbridge.

Sudhoff, Karl. **Leonhart Fuchs' table of eye diseases in the Latin original of 1538.** Arch. f. Augenh., 1926 v. 97, Dec., pp. 493-501.

Leonhart Fuchs was body physician to Duke George of Brandenburg from 1528 to 1533, and later professor in Tübingen. His table, here given in full, consists of the names of the diseases, printed in Greek and followed by explanations in the Latin. The table was in general use by medical students.

W. H. C.

NEWS ITEMS

News items in this issue were received from Doctors H. Alexander Brown, San Francisco; Gaylord C. Hall, Louisville, Kentucky; Walter B. Lancaster, Boston; Edward D. LeCompte, Salt Lake City; G. Oram Ring, Philadelphia; and Thomas Hall Shastid, Superior, Wisconsin. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the 12th of the month.

Deaths

Dr. Edward Leonard Hall, Ithaca, New York, aged sixty-six years, died December eighteenth.

Dr. Walter Almond Hager, South Bend, Indiana, aged sixty-four years, died December sixth of pneumonia.

Dr. Clifford H. Brooks, Santa Ana, California, aged forty-two years, died October eighteenth of angina pectoris.

Miscellaneous

Under the will of the late Mrs. Annie M. Pluygers, New York, the Industrial Home for the Blind was left $5,000.

The Curtis Hotel at Minneapolis has been selected as semiofficial headquarters for the ophthalmologists during the next annual session of the American Medical Association. It is within easy walking distance of the Lyceum, where the scientific meetings will be held.

On January 17 the Chicago Eye, Ear, Nose and Throat College opened a handsome new ten story building at the corner of West Washington and Franklin Streets, Chicago. The hospital has accommodation for 75 patients, five operating rooms, and a second floor devoted to a clinic and to postgraduate teaching.

A peddlar sold a pair of glasses to a man in Orange County, New York. He saw that the man's wife had trouble with her eyes. He returned in a few weeks with a "doctor" who could operate. This "doctor" proposed to remove her cataract by the use of radium in about fifteen minutes for $1,150. The state police, through the cooperation of New York City and the state health departments, arrested "Dr. Renner" (Simon Mohr). In default of bail, he was committed to jail in Goshen.

The Gill Memorial Eye, Ear, and Throat Hospital of Roanoke, Virginia, has arranged for four days of post-graduate instruction in ophthalmology, otology, rhinology, laryngology, faciomaxillary surgery, oral surgery, and bronchoscopy and esophagoscopy, March 19 to 22 inclusive. Instruction on ocular changes due to intracranial disease will be given by Dr. Emory Hill, Richmond, Va.; on pathology of the eye by Dr. A. B. Reese, New York; on routine perimetric study in every day practice by Dr. Luther C. Peter, Philadelphia; and on protein therapy in ophthalmology by Dr. Ben Witt Key, New York. There will also be clinics by Dr. C. A. Young of Roanoke, Dr. Emory Hill, Dr. A. B. Reese, Dr. Luther C. Peter, and Dr. Ben Witt Key, with a series of round table discussions.

Recently a law was passed in Michigan that drivers of motor vehicles for hire should pass an examination, and that no applicant should receive a certificate whose vision was less than fifty percent in each eye, whose hearing was less than seventy-five percent, and who was not free from clinical and laboratory signs of syphilis, and any other disease of the nervous system, and from any communicable disease dangerous to public health.

The Fifth International Medical Congress for Industrial Accidents and Occupational Diseases is to be held in Budapest in September, 1928. Papers are solicited from American physicians and dentists. The chairman of the American Committee is Dr. Emory R. Hayhurst, of Ohio University, Hamilton Hall, Columbus, Ohio.

Speaking before the 29th annual meeting of the Society of American Bacteriologists, Dr. Edward C. Rosenow, of the Mayo Foundation, Rochester, Minn. said he had found an organism which, injected into animals, produced symptoms identical with the "moon blindness" of horses.

Societies

Newly elected officers of the Utah Ophthalmological Society include Dr. A. H. Alland of Ogden, president, and Dr. V. P. White, secretary and treasurer. Meetings are held the third Mondays.

The Pacific Coast Oto-Ophthalmological Society will hold its next annual meeting in Santa Barbara, California, on April 18, 19, and 20, 1928, immediately preceding the meeting of the Western Section of the Triological Society there. Guests of the meeting will be: Doctors Norvil Harvey Pierce, John F. Barnhill, Luther Peter and Henry H. Tyson. The president is Dr. Wm. J. Mellinger of Santa Barbara.

The Louisville Eye and Ear Society held its annual meeting January twelfth, at the Brown Hotel. The guest of honor was Dr. J. W. Millette of Dayton, Ohio, who addressed the society on his "experience in intracapsular operation for cataract". Dr. Millette also held a clinic at St. Anthony's Hospital, Louisville, that afternoon at three o'clock.

The Eye, Ear, Nose and Throat Section of Los Angeles held its annual dinner on January first, at which time the following officers were elected

for 1928: Dr. Bertram Davies, president; Dr. R. W. Reynolds, vice-president; Dr. H. S. Muckleston, secretary-treasurer. Dr. Robert W. Miller gave a very interesting account of the history of the section. There was no scientific program.

At the December meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, Dr. C. E. G. Shannon, Professor of Ophthalmology of Jefferson Medical College, was elected chairman and Dr. Leighton Appleman secretary for the year 1928. Dr. E. B. Shumway as chairman and Dr. Appleman as secretary have served the section with distinction for the past two years, and the character of the service they have rendered was very cordially commented upon by Dr. G. E. deSchweinitz, chairman of the executive committee of the section, in making his annual report. Dr. S. R. Gifford, of Omaha, presented before the section a scholarly paper upon "diseases of the eye and adnexa due to fungi and higher bacteria". Dr. Gifford was the guest of honor at a dinner given by Dr. deSchweinitz preceding the section meeting.

On October 17th the Nashville Academy of Ophthalmology and Otolaryngology elected the following officers for one year: Dr. Leslie Bryan, president; Dr. Robert J. Warner, vice-president; Dr. Hershel Ezell, secretary.

The University of Minnesota has organized a thirty-three hour course in biomicroscopy in the postgraduate school of medicine, which will be given by Dr. L. W. Morsman during the winter quarter.

The next meeting of the German Ophthalmological Society will be held in Heidelberg August 6 to 8, 1928, and will be preceded by the usual social gathering on the evening of August 5th.

Personals

Dr. and Mrs. Fred Stauffer left Salt Lake City in October for a six months' trip around the world. In December they were in India.

Dr. John T. Carpenter of Philadelphia, after spending nearly a year abroad, has returned greatly improved in health and has resumed the practice of ophthalmology.

Dr. L. Webster Fox was recently at Fort Sewal, Florida, combining recreation with examination of the Seminole Indians. He finds they have a lot of trachoma.

Dr. F. Park Lewis of Buffalo addressed the thirteenth annual meeting of the National Committee for the Prevention of Blindness. The Committee has recently changed its corporate name to "National Society for the Prevention of Blindness".

Dr. Albert L. Brown, Cincinnati, presented at the December meeting of the Chicago Ophthalmological Society a case illustrating the relaxation theory of accommodation.

Dr. Vard H. Hulen has retired from active practice in San Francisco, and has returned to his former home in Houston, Texas.

Dr. James Franklin Smith has returned to San Francisco after spending several months in Europe.

Dr. Warren S. Reese of Philadelphia, associate in ophthalmology with Dr. Wm. T. Shoemaker at the Pennsylvania Hospital and in the Graduate School of the University of Pennsylvania, has been honored by election to fellowship in the College of Physicians of Philadelphia.

In the Klinische Monatsblätter für Augenheilkunde for November appears a paper by Dr. Rudolph Denig of New York on the isolation of old inflammatory iris incarcerations and prolapse.

Dr. Poos of the Münster eye clinic has been awarded the international Cirincione prize on account of his studies concerning the physiology and pharmacology of the intrinsic ocular muscles.

Dr. Emory Hill, Richmond, Virginia, was guest of honor and the speaker of the evening at the annual dinner of the Indiana Academy of Ophthalmology and Oto-Laryngology, Fort Wayne, December fourteenth and fifteenth. His subject was "Ophthalmologic studies in the diagnosis and location of brain tumors".

Dr. Edmund B. Spaeth of Philadelphia, associate in ophthalmology with Dr. Luther C. Peter in the Graduate School of the University of Pennsylvania, was elected to fellowship in the College of Physicians of Philadelphia at the January meeting. Dr. Spaeth is also associated with Dr. Peter in the ophthalmological department of the Temple University School of Medicine, as well as in private practice.

Dr. L. Webster Fox of Philadelphia has published a little pamphlet entitled "The Pueblos of New Mexico", a copy of which he was kind enough to send us. We have long been familiar with Dr. Fox's ability as an ophthalmological writer, and now stand uncovered before his ability to describe what he saw in this land of sunshine and historic monuments of Indian antiquity.

Dr. James Moores Ball, Saint Louis, has written a new book entitled "Sack-em-up men," which will soon be published by Messrs. Oliver and Boyd, Edinburgh and London. The book describes the status of teaching anatomy in Edinburgh ninety-nine years ago, when material for dissection was obtained by robbing graves and by other illegitimate methods.

THE INTERNATIONAL OPHTHALMOLOGICAL CONGRESS, 1929

The committee of Dutch ophthalmological surgeons who are organizing the Congress to

be held in Amsterdam in September, 1929, have already made considerable progress in their arrangements, and ophthalmologists may expect to receive in the near future a preliminary notice and invitation. At the request of the Dutch committee, two of the non-Dutch officials of the International Council recently visited Leiden and spent two strenuous days in consultation with the president, Professor van der Hoeve, and the two secretaries, Dr. Marx, secretary of the International Council, and Professor Zeeman, secretary of the National Committee. At these meetings the following provisional arrangements were made for the Congress:

The Congress will open at Amsterdam on Thursday, September 5, 1929, in the afternoon, with a general meeting and reception of delegates. The offices of the Congress will be open from 9 o'clock that morning for members to inscribe their names and receive their cards of invitation and dinner tickets, etc. In the evening there will be a reception by the Burgomaster of Amsterdam. The scientific meetings will take place twice daily on Friday, Saturday, Monday, and Tuesday, at Amsterdam, and on Thursday and Friday at Scheveningen. On Saturday evening the seventh, at Amsterdam, there will be a special concert, and on Monday evening a special cinema film illustrating Leeuwenhoek's life and work will be shown. On Sunday the eighth, there will be excursions from Amsterdam. Wednesday the eleventh will also be devoted to excursions, but instead of returning to Amsterdam members will go to Scheveningen, whither their luggage will be taken by special train, and in the evening the banquet will be held in the Casino at Scheveningen. On Thursday night there will be a Government reception at the Hague and on Friday the final scientific meetings and the general meeting of the Congress will be held. (British Journal of Ophthalmology, January, 1928.)

SUBSCRIBERS TO INTERNATIONAL OPHTHALMOLOGICAL COUNCIL FUND

Second List

Societies, institutions, etc.

American Ophthalmological Society
Austrian Ophthalmological Society
Belgian Ophthalmological Society
Buffalo Ophthalmological Club
Central London Ophthalmic Hospital
French Ophthalmological Society
Hispano-American Ophthalmological Society
Ophthalmic Clinical Hospital, Helsingfors
Ophthalmological Society of Oslo
Paris Ophthalmological Society
Royal Society of Medicine
Swiss Ophthalmological Society
Union of Ophthalmologists in Finland
Western Ophthalmic Hospital

Individuals

Batten, Rayner
Beach, S. J.
Bedell, Arthur J.
Brawley, Frank
Briggs, Wm. Ellery
Brown, A. L.
Bruner, Wm. Evans
Burch, Frank E.

Charles, J. W.
Colver, B. N.
Connor, Ray
Coppez, Henri
Craig, James A.
Crisp, W. H.

Davis, Wm. T.
Dean, F. W.
Dunnington, John H.

Fox, L. Webster
Fuchs, Adalbert
Fulkerson, C. B.

Garrow, A.
Gibb, H. P.
Gifford, S. R.
Greenwood, Allen
Grönholm, V.
de Grósz, Emil

Hagen, S.

Imre, József

Jack, Edwin E.

Killen, W. M.

Knapp, Arnold
Krug, E. F.

Larkin, Bernard J.
Lewis, Park
Lindberg, Y.

Malling, B.
Marshall, J. Cole
Meyerhof, Max
Millette, J. W.
Morax, V.
Muncaster, S. B.
Mundt, G. Henry

Patton, J. M.

Rea, R. Lindsay
Reese, Warren S.
Roberts, W. H.
Rolston, John R.

Santos, Costa
Scott, Rupert
Snyder, Walter H.

Taylor, Lewis H.
Thompson, A. Hugh

Viner, Geoffrey

Weeks, Webb W.
Wells, David W.
Werner, Sigurd
Wiener, Meyer
Wilson, Edward F.
Woodruff, Henry W.
Würdemann, H. V.

Papers of special interest: The papers here listed have been read by members of the editorial staff and collaborators, or attention has been called to them by readers. They seem worthy of bringing to the notice of ophthalmologists in general, although some of them cannot be abstracted or reproduced to advantage. Any reader who wished to become acquainted with all that is written on a particular topic should go over the Cumulative Index Medicus, published by the American Medical Association, and check the titles of articles that refer to the subject or subjects in which he is particularly interested. It is hoped that this brief list of important papers and monographs will be more helpful to the mass of readers than the longer lists. *E. J.*

Awguschewitsch and Nikolaewa. Treatment of dacryocystitis with bouillon vaccine after Besredka. Zeit.f. Augenh., 1927, v. 63, p. 331.

Baurmann. Estimation of intracranial pressure by help of retinal venous pulse. Bericht der deutschen ophth. Gesellschaft, Heidelberg, 1927, p. 96.

Blum, H. N. European eye clinics. New Orleans Med. and Surg. Jour., 1927, Dec. p. 368.

Dawson, W. S. Ocular spasms in epidemic encephalitis. Med. Jour. Australia, 1927, Dec. 3, p. 779.

Dejean, C. Paralytic syndrome from apex of orbit. Arch. d'Opht., 1927, Nov. v. 44, p. 657.

Holth, S. Iridencleisis with iridotomy in acute glaucoma and buphthalmos. Klin. M.f. Augenh., 1927, v. 79, p. 620.

James, R. R. The father of British optics: Roger Bacon, (1 pl.) Brit. Jour. Ophth., 1928, v. 12, p. 1.

MacRea, A. Webster's operation for entropion of upper lid. Brit. Jour. Ophth., 1928, v. 12, p. 25.

Parker, W. R. Cataract extraction. Comparative results by different methods. Jour. Amer. Med. Assoc., 1927, v. 89, p. 2252.

Pavia, J. L., and Dusseldorp, M. Tuberculous wart of eyelid. La Prensa Med. Argentina, 1927, Nov. 30, p. 705.

Schnyder, W. F. Type of familial, presenile, subcapsular cataract with vitreous changes. Klin. M.f. Augenh., 1927, v. 79, p. 585.

Török, E., and Redway, L. D. Three cases of keratoconus. Arch. of Ophth. 1928, v. 57, p. 19.

Wilmer, W. H. Clinical aspects of ocular tuberculosis. (2 col. pl.). Arch. of Ophth., 1928, v. 57, p. 1.